RAILROAD GAZETTE

FRIDAY, DECEMBER 3.

The Late Walton W. Evans.

We have to note this week the death of an old and well-known engineer, Mr. Walton W. Evans, who died in New York, Nov. 28, and whose loss will be widely regretted. For the following obituary we are indebted to the New York *Herald:*

Mr. Walton White Evans, who died at his home in this city on Sunday last, aged 70 years, was almost the last survivor of that small but talented corps of engineers which the United States sent to our South American sister republics to overcome the apparently insurmountable barriers to railroad enterprise which nature in many of those countries presented.

At the time of his death Mr. Evans was, with a single exception, the oldest living graduate of the celebrated Polytechnic Institute at Troy, in this state. One of his first connections with that series of railroad works of maguitude which have made his name famous, not only on the American continent, but in Australia and New Zealand, was his association with the engineers who built the Harlem Railroad.

He continued in the practical exercise of his profession for several years in different sections of the country wherever engineering skill was required to push the lines of communication from city to city and state to state, in defiance of every obstacle in the way. He was then invited by the Chilean government to visit that country, where he at once commenced building railroads, being soon after his arrival there appointed Chief Engineer under the Republic. In this capacity he built nearly all the important railroads which traverse that country. He visited several of the other South American Republics, projecting and building railroads, and adding to the prosperity of the government and the happiness of the people by his works.

Besides his railway enterprises, one of which was the building of the first steam railroad south of the Equator—an enterprise of which he was especially proud—Mr. Evans designed and superintended the erection of many of the public edifices and private mansions which adorn the capitals of the South American Republic. Central America and Mexico are also indebted to the deceased engineer for the blessings of that higher civilization which follows on the opening of railways through rich and fertile countries previously undeveloped.

At this time the fame of the New York engineer secured for him an invitation from the South Australian government to visit that country. He made for that government designs for a series of public works on railways and in government buildings, and also for New Zealand.

He also devoted his time to the consideration of canal construction and has written a series of articles on interocean canal communication which have attracted great attention on this continent and in Europe. He was an indefatigable student, never wearying in the study of the problems which presented themselves in the carrying out of novel and previously untried enterprises, and elucidating with the accuracy of the draftsman and the clearness of an apt writer the difficulties presented and overcome in his experiments. Many of his writings in this direction are valuable additions to the engineer's library.

Mr. Evans was a member of the Institution of Civil Engineers, the American Society of Civil Engineers, and of the Council of the American Geographical Society. He has also filled many positions of trust and responsibility on special occasions in connection with his profession, bringing his close study and critical test of every new invention and design into practical operation. Whenever engaged in the employment of foreign governments or corporations, he contended for and always secured the introduction of American mechanical products in the prosecution of his undertaking. His loss will be deeply felt by his professional brethren, not only in his own country, but in those lands where, through his works or writings, his name is known.

Mr. Evans was the grandson, on the maternal side, of General Anthony White of revolutionary fame, and was a member of the Society of the Cincinnati.

The Late Gilbert C. Breed.

Few men had a more varied experience in railroad work than Mr. Gilbert C. Breed, who died in Louisville, Ky., Nov. 17, after a short illness. Though still in the prime of life, he had seen service on many roads, and had filled positions in about every department of railroad work. The following account of his life is from the Louisville *Courier-Journal:*

Gilbert C. Breed was better known to a generation of people who rank among the older citizens of Louisville. Among his warm personal friends were Dr. E. D. Standiford, Frederick De Funiak, Victor Newcomb, now of New York, the late ex-Mayor Baxter, and many others who had gone the long journey. As a railroad man and civil engineer, he ranked very high; in fact, he was considered one of the best informed railroad men in the country. He was married in 1858 to the daughter of Dr. C. C. Cooper, of Clarksville, Tenn., who survives him. He leaves also two children, both grown, Mamie R. and Chas. C., the latter Division Engineer of the Maysville & Big Sandy Railroad, with headquarters at Ashland. Mr. Breed was born Nov. 17, 1829, at Stonington, Conn. Though his parents were poor, he received a thorough English and practical classical education, and also acquired at good knowledge of engineering. At 17 he taught school. A 20 years of age he entered the service of the Rochester & Niagara Falls Railroad Co., and remained with it until its completion. He then assisted in the survey of the Corning & Olean Railroad, an enterprise which was never completed. His experience with railroads thus far determined him to continue the business, and in 1854 he helped to locate the Lake Erie, Wabash & St. Louis, later known as the Toledo, Wabash & Western. He remained with this road until its completion in 1856, when he removed to Kentucky and was at once engaged on the Memphis, Clarksville & Louisville Railroad, as Assistant and Chief Engineer, holding those positions till the beginning of the civil war. During the continuance of the war Mr. Breed was occasionally employed in the engineering service of the Nashville & Chattanooga and the Nashville & Decatur Railroads. Toward the close of the war he resumed his old position of Chief Engineer and Superintendent of the Memphis, Clarksville & Louisville, now known as the Memphis Branch of the Louisville & Nashville. Subsequently he resigned his position and quit the railroad business temporarily, being appointed Assessor of the Sixth Tennessee district by President Johnson. He, however, soon resigned the office, and returned to the Memphis, Clarksville & Louisville, acting as Auditor, General Ticket and Freight Agent until 1872, when he came to this city, and became Purchasing Agent of the Louisville & Nashville. In 1875 he became Secretary to the President of the road, and in 1879 was made Assistant General Manager. He remained with the Louisville & Nashville in the capacity mentioned until January, 1883, when he resigned his position with that corporation and became Auditor and Purchasing Agent of the Louisville, New Albany & Chicago Railroad. His connection with that road lasted but one year, when the road changed hands and he tendered his resignation. Since then he has not been actively engaged in business, and has lived quietly for a time at Glendale, near Cincinnati, and latterly in this city, with his small family. His genial, upright character and pleasant manner won him hosts of friends. His loss is deeply regretted by a large circle, and his death marks another vacancy in a class of citizens whose worth is inestimable to the community, and who are fast answering the inexorable demands of time.

Cracking of Paint and Varnish on Cars.

At the recent convention of the Master Car and Locomotive Painters' Association, Mr. Wm. Davis, of the Canada Southern, presented a paper on this subject. Mr. Davis stated that some ten months ago, following out instructions given at last convention, he painted some 20 panels in three different body colors—olive brown, Tuscan red and yellow. One-half of these panels were also varnished, the paint on the other half being exposed. In varnishing he used different formulas, rubbing the first coat in some and finishing with two finishing varnishes. In others he used medium with two coats of finishing, and still others with three coats of finishing varnish. The paper continued:

I find that upon examination of the panels before me that those done with the least oil are so far showing the best surfaces. The varnish on these panels stands out more solid and brilliant without as yet the sign of a crack, as does also the painted part, while those done with the most oil seem to have flattened the varnish surface. I have also three or four boards that I painted and varnished over three years ago. The boards were painted after or rather with the same formula, Japan colors, as I painted my coaches. They have been exposed in all kinds of weather for over three years, and yet there is not the least sign of a crack. Of course the varnish has perished to a certain extent, but the paint is still as solid to all appearances as when first put on, and yet some of the coaches done with the same formula have cracked, more particularly at right angles with the panels, while other coaches have not the appearance of a crack. I also notice that the large iron panels in centre of cars, as well as iron battens and corner plates, are without any cracks, but stand just as solid as when first painted, while the woodwork on the cars is cracked. True, in some cases the paint on the iron may flake off, but that is invariably owing to the presence of rust under the paint. Now, perhaps, you ask how do I account for this. Well, I invariably notice that these cracks start or commence at the battens or joints and nail holes, and run nearly across the panel. I account for this in two ways. In the first place we are apt to allow too much of an accumulation of paint and rough stuff along the edges of the battens and in the depressions caused by the nails by not sandpapering and rubbing down close enough, this more particularly near the battens or joints of sheeting. Now after the car has been exposed for awhile the battens warp, shrink and draw away from the panel, thus breaking away from the paint and leaving an opening for the admission of moisture in any form to enter either under the battens or through the broken painted surface, thus undermining the whole structure of paint. You will also observe that the panels being well and firmly screwed or nailed to the studding under the battens, those same screws and nails causing dampness and rust; all has a tendency to destroy the life of the paint. Now under these circumstances the panels held firmly to the studs or frame of car cannot readily give with the strain or sudden jar of the car, which I think would cause the paint and varnish to give way first at those places, when in the course of time it extends across the panel or sheeting as the case may be.

I have noticed—what I consider a remedy to some extent—that those coaches that were well primed under the battens and edges and backs of panels as well as the face of frame and sills were well painted and the battens put on with stiff white lead on the under side and well nailed, very seldom showed any cracks. This applies as well to sheeting. In the second place if you observe your cars closely you will see that the perishing or cracking takes place first on the battens where it comes in contact with the window sill, as also under the window sill near the battens. You will see at a glance that this is caused by moisture or water that gets between the window stop and sash and then runs down behind the battens and back of panels or through the top edge of panel, which is generally void of paint or anything to protect it from dampness. You can easily suggest a remedy here. As I said before, cracks caused by poor material may be remedied at the will of the purchasing agent.

I have tried the method of having our standard body colors ground stiff in oil as well as in Japan and I have always found the best results in favor of Japan colors. It seems to me unreasonable to put a slow hardening as well as a slow drying body of paint under a quick hardening body of varnish (rubbing or even finishing in some cases) and expect that there will be no cracking of either the varnish or paint unless days are allowed for each coat of paint to dry. On the other hand, if Japan colors ate used after building up your foundation if it is necessary you can then use just what proportion of oil may be necessary in your Japan colors, but I should say be very sparing of your oil in your finishing colors and allow a reasonable time to dry, discarding the use of rubbing varnish on the outside of coaches or over painted surfaces and you will have reason to expect good results.

New York Tunnels, Terminals and Railroad Connections.

Various causes have combined to maintain the confessedly defective terminal system of this port. In the first place there are large investments in the flotilla for river and harbor transportation to be seen about the waters of New York, and these interests oppose improvement. It is notorious that large operators in this field of enterprise all get rich, or secure a very handsome competency; and while this proves that there is a good opening for investment in enterprises designed to facilitate the local handling of merchandise it suggests a possibility of obstructions wherever vested interests can be made influential. The large profits only serve to increase the number of tubs, more or less nautical in shape, that float around the harbor to the obstruction of navigation; and so long as the average man sees a chance to double his money by investing in an old tug, barge or lighter, he will not be likely to give much thought to works of scientific construction, nor to encourage any movement that looks to an invasion of his privileges.

Another and more potent cause for our defective terminal machinery, however, will be found in the apparent apathy with which the subject has been treated by the railroads. There is a popular impression that it is a subject which chiefly concerns the roads, and that if their managers do not see the advantages of improved terminals it is not worth while for independent investors to look into the subject with a view either to profit or to public utility. But the situation of the railroads is peculiar. Their ground of competition with each other lies chiefly at a distance, in the West or South; and when they have succeeded in reaching the harbor of New York with their merchandise they seem to regard themselves as no longer competitors, and to believe that any considerable amount of money expended here would be a waste of resources. They struggle to extend their Western connections by large expenditures of money, and neglect terminal improvements here of great local importance. We think their policy largely mistaken. They are transporting freight and passengers away from New York as well as toward this point; and the railroad that could connect most conveniently with the warehouses, and reach most directly the converging points of travel, would get the lion's share of even the long distance traffic. But the railroad managers do not seem to view the subject in this light. They struggle only for the possession of distant territory, and if asked to consider a plan for terminal improvements of local interest they plead their necessities elsewhere as an excuse for delay.

If the people of New York ever expect to find themselves conveniently served, they must not wait for the railroads. The roads that have their permanent terminals on the right bank of the Hudson River consider themselves on a fair footing of equality with each other, and the newly-arrived Baltimore & Ohio road will have too many millions to expend in perfecting its Staten Island terminus to give much attention to anything else for 10 years to come. If we wait the motion of the railroads our outlandish flotilla of river and harbor craft will go on multiplying from year to year until the harbor is made almost impassible for ships bound on serious voyages, fortunes will continue to be wasted on a worse than useless service, and the commerce of the port will soon reach that acute point of suffering which in patients with a not sturdy constitution usually precedes a collapse. In this case a general catastrophe may not follow, since the port of New York is certain to maintain its supremacy. But what is called the port of New York is a name with a very broad significance. Want of the right terminal works may lead to a dispersal of traffic which the city of New York cannot afford and which it ought not to permit.

There is an urgent demand for at least three tunnels under the Hudson River, one with a terminus near the Brooklyn Bridge, another at the point selected for the unfinished tunnel opposite Morton street, and still another at some point further uptown, say at Forty-second street, where it could be made to connect readily with the New England Railroad at the Grand Central Depot. A tunnel at the latter point, even extended all the way under Forty-second street, from the river to the depot, would cost less money than either of the expensive bridges projected and under construction at Poughkeepsie and Cornwall, and it would serve the purposes of general railway communication even better than those bridges. It would place the upper part of New York, too, a section that will abound in factories when the Harlem River improvement is completed, in direct communication with the coal and iron fields of Pennsylvania, and overcome all the disadvantages of our insular and peninsular position.

But the suggestion of a tunnel at Forty-second street is for the present only a flight among the possibilities. The case for urgency will be found in the completion of the tunnel already begun at the more central point, and carried far enough to demonstrate its entire practicability at no very excessive cost. Its practicability, however, hardly needs demonstrating. Tunnels under channels are everywhere practicable if the water be not too deep; and the only question to consider refers to utility and profit. On the point of utility for the Hudson River Tunnel there is hardly a chance for question. When the cars from the opposite side of the Hudson can reach West street without the intervention of floats, and after having discharged and received their lading, be returned again by the ordinary agencies of railway traction, the railways can retire from service a flotilla of tugs that costs the interest on several times the amount of money that it will cost to build and operate the tunnel, and terminal charges may be correspondingly reduced. It should go without saying that an agency for transportation that could do its work for less than one-fifth the present cost, which, for the whole harbor, amounts to the interest on at least $35,000,000 for freight traffic alone, could be made profitable even were there no passengers to be transported. But when it is considered that the tunnel, during the morning and evening hours, at least, would probably run a passenger train every two or three minutes, it will be seen that there may be very good reasons for even glowing anticipations of profit.

It is a work that should be completed without delay.—*Real Estate Record and Guide.*

Contributions.

The Elevation of Curves.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Reviewing some portion of the work of the Roadmasters Association of America held in St. Louis, October 12, 13 and 14, I wish to notice particularly one thing: The question of elevation of curves. The committee recommends as a general elevation ½ in. per degree for a speed of 30 miles an hour and over, not to exceed ordinarily a total of 6 in., etc. [See *Railroad Gazette*, page 720, Oct. 22.] With a practical experience and observation of 15 years, I wish to say that if railroads adopt 1 in. elevation per degree, as proposed by that committee, as a standard for 40 miles an hour and over, the result will be that the locomotives will haul from one to two cars per train less than they ought to do. For twelve years the rule on the Atlantic & Great Western and the New York, Pennsylvania & Ohio was ½ in. to the degree, and for the first five years of that time, with rails of very poor quality (a great number of them being as short as 7 ft.) the speed of the passenger trains on many parts of the road was 60 miles per hour and sometimes over that. This was timed frequently by the speed recorder in the President's car.

Since 1874 there has not been a single derailment caused by too little elevation of curve. As soon as the curves on this road were uniformly reduced to ¾ in. for 6 ft. gauge and ½ in. for standard, per degree, a marked increase in the hauling power of freight locomotives was noticed. There never was a passenger killed, and but two or three slightly injured in that time. I therefore say that the roads that adopt one inch to the degree for elevation where they have heavy grades and curves, will have to drop from one to two cars on their freight trains, which will cost a road hauling

40 trains per day, at least $100 per day, and probably a great deal more.

On nine-tenths of the roads of the United States one-half inch per degree is abundant. On the trunk lines where the passenger speed is as fast as the wheels can turn, and where the freights are allowed to run 30 miles an hour, half an inch may be too small, and yet the road above mentioned has run successfully with that elevation. Within the last two years, with my consent, at the last annual meeting of the road-masters of our road, the elevation was permitted to be changed to ¾ in. to the degree. This is entirely successful with a general advance in the speed of trains, though the principal trains do not run much if any faster than formerly. I would, therefore, say that in my opinion, the result of observation and practice, there is no occasion, with the highest speed yet practiced, to go above ¾ in. to a degree, except it be where the track is specially set apart as a passenger track where all the trains require to make the greatest speed possible. Practice proves that it is not necessary to give the highest elevation required by the technical rule, even for passenger trains.

The question of elevation and arrangement of curves calls for the application of the highest track talent on any road, and that road which gives it the most attention, with a careful use of the level, will have the greatest praise from the traveling public, and hence the largest business. Practice is good, but theory also is required. Where they work together, success is the result. I have touched upon this subject because I recommended ½ in. as sufficient in the "Roadmasters' Assistant," and, subsequently, two years ago, our road, with my consent, adopted ¾ in. for standard gauge when a general advance in speed took place.

Of course, neither ½ in. nor ¾ in. is a "cast-iron rule" inasmuch as so much elevation is not required at or near crossing or at stations where all trains stop.

CHARLES LATIMER.

[We have commented on this letter in another column.—EDITOR RAILROAD GAZETTE.]

Water Lubrication of Locomotive Flanges.

BRIDGEPORT, Conn., Nov. 21, 1886.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Something entirely new in railroading is now being tested on one of the fast express engines of the Housatonic Railroad, where it has been in use for the past month or so. It is the invention of a young mechanic, Mr. John Quigley. He attaches a system of pipes from the tender tank down to the first set of trucks behind the driving-wheels, and keeps a jet of water playing on the first two wheels behind the driver, thereby keeping the wheels and the rail of the entire train lubricated with water, or, in other words, keeping the driving-wheels on a dry rail and the rest of the train on a wet one, thereby making the cars run more smoothly than formerly. The question now is:

How much of the rolling friction of a heavy train is saved?

Some say about one-sixth: others more, but how much more is now the question to determine. Only about a barrel of water per hour is required. C.

[It has been well determined that, while a damp rail decreases the adhesion of the drivers, a thoroughly wet rail gives a somewhat higher co-efficient of friction than one entirely dry; so much so that a stream of water such as our correspondent describes has been thrown upon the rails in front of the drivers instead of behind them, so as to increase their adhesion. It was claimed, however, that this jet decreased the flange friction of the drivers materally. Why any great advantage should result from throwing a stream of water on the wheels and track behind the drivers we do not perceive, although it would certainly do no harm and might do some good.—EDITOR RAILROAD GAZETTE.]

Charles Dickens on Locomotive Mileage.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As long mileage and regular work is often recorded in our mechanical engineering newspapers, I have thought that my performance since I was turned out of Crewe's Works, on February 6, 1882, would interest your readers.

As soon as I was built I was sent to Longsight, my builder being anxious to see the greatest amount of work I could do in the shortest possible time; and it was arranged that I should run as often as I could from Manchester to London and back for a day's work, and for that purpose I was put in the charge of David Pennington and Leigh Bowden, the proposed work being more than one man could do and at the same time take necessary care of myself and the passengers.

I commenced running on March 3, 1882, taking the 7:45 a. m. train out of Manchester, and returning with the 4 o'clock out of London; and this work I have done regularly—in fair weather and foul, in snow or rain—with the exception of forty-eight trips when I was on the sick list. This work, together with other odd runs I have made, gives 501,135 as the total number of miles I have run; in fact, I am so regularly on the road, that my friends whom I have carried safely so often between Manchester and London, instead of mentioning the time of the train they propose to travel by, say "We'll go with Charles Dickens!"

On Sept. 7, 1886, I was sent home to Crewe, needing further medical treatment and a new suit of clothes, and I am glad to say that I am now in vigorous health and again on the 7:45 out of Manchester.

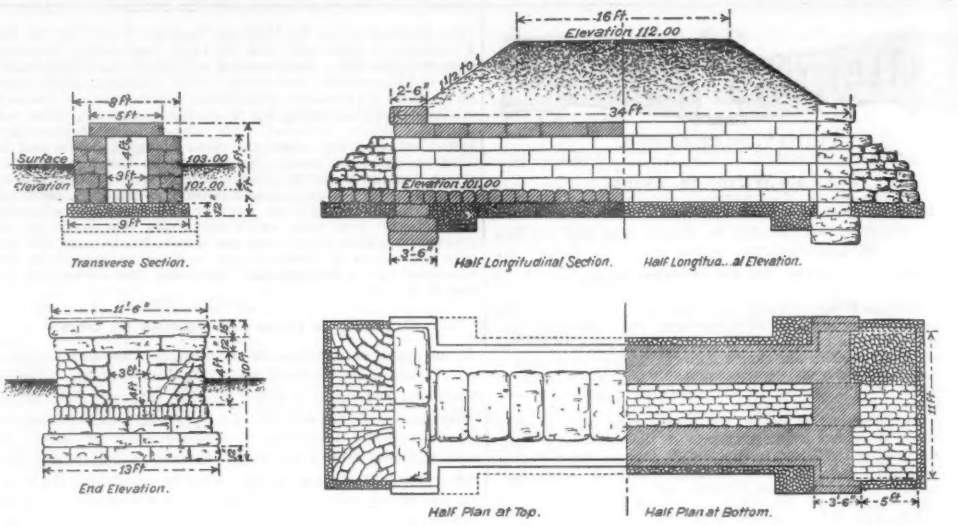
I have made 1,327 journeys to Euston and back and 55 other trips during the past four years and a half, which gives an average daily mileage of over 362, and I think the distance I have run in that time will compare very favorably with any of my sisters in this country or even with the best performance of our cousins on the other side of the Atlantic, and I shall be glad at all times to see my many thousand friends whom I have previously carried. I am, etc.,

"CHARLES DICKENS" (Engine No. 955).

LONGSIGHT STATION, London & Northwestern Railway.

I have no objection to this letter from "Charles Dickens" being published, and certify the statements made are correct.

CREWE, Nov. 11, 1886. F. W. WEBB.



BOX CULVERT—INTERCOLONIAL RAILWAY.

Culvert Plans.

MONCTON, N. B., Canada.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In answer to the question of W. O. Lelimé, in your issue of Aug. 6, I consider box culvert fig. 2 superior to fig. 1.

A common fault of culverts is that the end walls are not placed deep enough in the ground, and the frost throws them

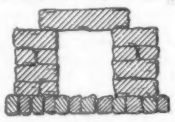


Fig. 1.

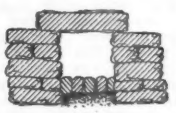


Fig. 2.

up. The accompanying drawing of a standard box culvert of the Intercolonial Railway is specially designed to meet this. We are now building them after this plan on the Pictou Town Branch. WM. B. MACKENZIE.

The Solution of the Car Coupler Question.

COLUMBUS, O., Nov. 29, 1886.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It was a very good and timely suggestion of Mr. Lorraine, in your issue of Nov. 26, to settle the coupler question by having all the vertical planes enter a competetive test, the successful coupler to receive the letters patent and all the right, title and interest of the losers. The Dowling coupler will cheerfully enter such a test, as it has entered all other tests. Its only stipulation would be that the Janney shall be considered the standard type and that all others shall couple with the Janney and consequently with each other.

The verdict would, of course, be given upon the points of: First, performance; second, strength; third, construction; no coupler to enter whose patents have not been certified by the Eastern Railroad Association.

This plan would soon settle the question.

H. SABINE,
General Agent Dowling Coupler.

Weights of Girder Bridges.

A recent paper before the Institution of Civil Engineers on "Some Points for the Consideration of English Engineers with Reference to the Design of Girder Bridges," by Messrs. W. Shelford and A. K. Shield, gives the accompanying diagrams showing the comparative weight of bridges of various design, and discusses the general question of the proper design of bridges in a frank and careful manner. The existing deficiencies of English practice, which have enabled American competitors to distance them so frequently when the merits of the two systems have had a chance to be fairly weighed against each other on equal terms, are commented on with notable and healthy frankness, as appears from the opening sentences, giving the scope of the paper:

"Engineers with an eye for bridge-building cannot fail to be struck by the difference in general appearance between English, German and American bridges. The ordinary plate girder unquestionably finds more favor in England than elsewhere, while in Germany it seems to have been more or less discarded in modern practice, and is replaced by lighter structures, designed with a more scientific disposition of the material, and constructed chiefly of angle and bar iron. Both in Germany and America the modern practice appears to adopt large panels and great depth—a system of construction which has been greatly facilitated by the use of steel, owing to the greater length of the bars and plates procurable in that metal, and the consequent diminution in the number of joints. In America, also, pin-jointed bridges are the rule, and riveted joints the exception—exactly the reverse, in fact, of the English practice—and the deep pin and link truss, with a straight top boom and long panels, there almost the universal method of construction for spans over 75 ft., differs in a striking manner from both English and German bridges. Its construction has been brought to considerable perfection, and appears to be eminently suitable for a country where distances are great, and labor scarce and expensive, and rapid construction of utmost importance. By this system the Americans are able to turn out a bridge with the greatest accuracy and expedition, and can erect it without previous erection in the shops, and with little staging, in an incredibly short space of time. In England, on the other hand, a strong bias among engineers in favor of riveted joints has led to the absence of special appliances for the manufacture of pin and link bridges; and the practical advantages of the system are less esteemed, as English engineers do not push forward their railways so rapidly as the Americans. As most English railway engineers must now look chiefly to the development of new countries for future work, these general facts should be sufficient ground for an examination of their practice; but if more definite reasons are sought, reference may be made to the case of Canada, where English engineers who built the first bridges have since been superseded by Americans. The design of a bridge of exceptional span is almost invariably the subject of special study to an extent which is inadmissible in the case of bridges of ordinary size. These are usually constructed in accordance with a limited number of standard types, which experience has shown to be suitable, and it is to these only that such general considerations as have been suggested properly apply. The economic importance of smaller bridges is also greater, and it is to bridges of spans less than 200 ft. which, with reference to the American system, may be termed merchantable sizes, that the scope of this paper is therefore limited."

In order to determine the extent to which the weight is affected by the design, the seven designs illustrated were computed for a bridge of 140 ft. span, double track, with results shown by the table at the side. The assumed rolling load was 1⅗ tons or 3,733 lbs. per lineal foot of each track. The weights given include "plate flooring, rail bearers and cross girders," and the necessary wind bracing. They may, therefore, be said to include the entire shipping weight of a bridge of such span for each design. The broad features of the designs, which are almost sufficiently clear from the engravings themselves, may be thus summarized:

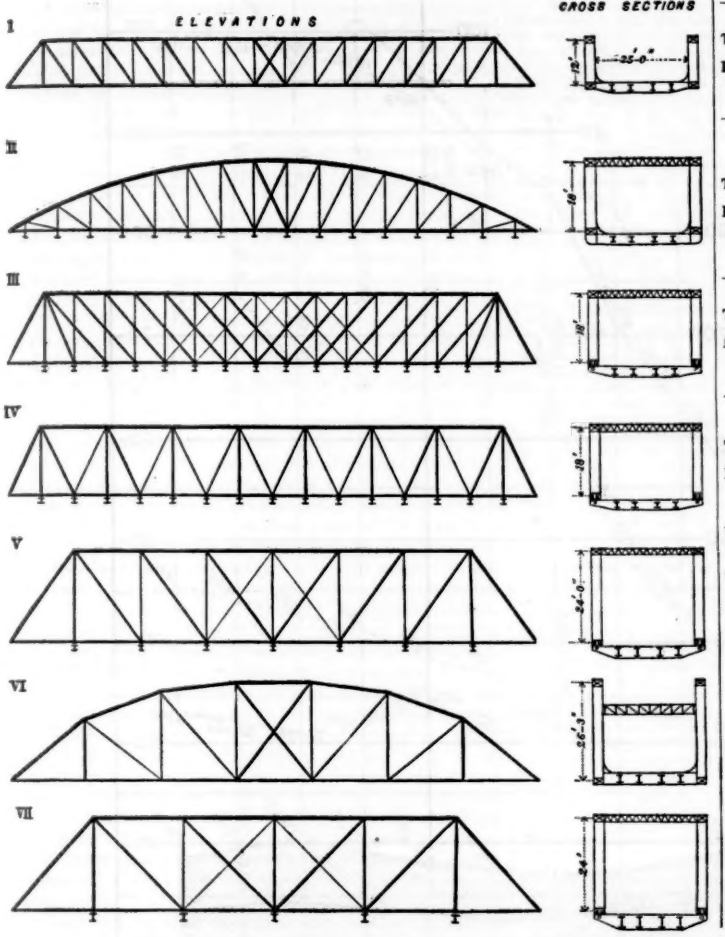
1. Riveted bridge, 8 ft. panels, 12 ft. deep. } Lateral stiffness entirely from plate floor.
2. Bow-string girder, riveted, 18 ft. deep. } Lateral stiffness entirely from plate floor.
3. Pin-connected throughout. } Girders 18 ft. deep, admitting complete system of lateral bracing between top chords. Mr. Charles Bender gives the preference to No. 3.
4. Pin connections lower chords only. } Girders 18 ft. deep, admitting complete system of lateral bracing between top chords. Mr. Charles Bender gives the preference to No. 3.
5. Ordinary type of American bridge, 24 ft. deep, 17 ft. 6 in. panels.
6. Polygonal girder, panels 20 ft. long. Lateral stiffness entirely from the floor.
7. Suggested by central span of the Niagara cantilever bridge; panels, 24 ft.

Plate floors used throughout in order to compare weights fairly, "although in America they would be replaced by heavy timber decks, with diagonal bracing of iron rods."

Commenting on the designs, the paper says:

"From these examples it will be seen that the difference in weight of good designs of the same depth is comparatively trifling, and is not greater than might be compensated by local considerations, such as the relative cost of labor and material, facilities for erection, and the difference in cost of various methods of construction, while the fundamental principle that the weight of a girder decreases as the depth increases is generally applicable to an extent, which, if recognized in theory by English engineers, has not hitherto found general expression in their practice. The extra depth required for the rail bearers in bridges with long panels is, however, in England, where the headway is frequently very limited, more often than elsewhere prohibitory of the adoption of the most economical form for the main girders; and although the question of design requires careful study, there is no evidence of the existence of inherent national errors or prejudices in design which would be likely to place English engineers at a disadvantage in dealing with colonial work, or to account for the fact that they have lost it in Canada and recently in one case in Australia. It has been suggested that the position of the designer in America is more favorable to economy of construction. In America, when a bridge is required, the railroad company invites tenders for its construction and erection in accordance with their specification, which generally states the class of bridge preferred, the load which it is to carry and the quality of the material, and defines in considerable detail the stress to which its parts may be subjected. The design is left to the bridge company tendering for its construction, but it is

WEIGHTS OF VARIOUS TYPES OF GIRDER BRIDGES, 140 FT. SPAN



Weights.	Main Girders & Stiffening.*	Platform or Floor.†	Total.
	Lbs.	Lbs.	Lbs.
Total	232,000	193,600	425,600
Per ft. of span..	1,660	1,380	3,040
Total	211,500	193,500	405,000
Per ft. of span...	1,540	1,390	2,930
Total....	199,500	193,500	393,000
Per ft of span...	1,433	1,388	2,821
Total.....	185,500	193,500	379,000
Per ft. of span...	1,321	1,388	2,709
Total. ...	166 800	182,000	348,800
Per ft. of span...	1,187	1,298	2,485
Total.....	Inspe	arable	345,000
Per ft. of span...	.....	.....	2,462
Total.....	151,800	187,500	339,300
Per ft. of span...	1,074	1,344	2,418

* Includes Wind Bracing. † A plate floor is included in each bridge in order that the weights may be compared.

required that sufficient information shall be supplied with each tender to enable the railroad engineer to examine the proposal and determine whether it fulfills the required conditions. The designer, who is consequently employed by the bridge company, has in the first place to produce the most economical structure, while the primary responsibility for its safety lies with the railroad engineer, who has prepared the specifications and will be enabled to check the correspondence of the design with his requirements before the tender is accepted, and to make the necessary modifications—a work of considerable difficulty unless the design in a good one to begin with. The English designer, on the other hand, has in the first place to design a safe structure, since he is seldom immediately subject to competition in respect of its economy, and is entirely responsible for its security. In the interest of security the advantage of the English system can hardly be disputed. Its economic disadvantages are that the engineer is seldom able to ascertain either the exact cost of his designs or the relative economy of their details; nor has he any personal interest to serve or any other inducement to reduce the cost to the lowest point. The system, moreover, entails a want of correspondence between the design and the appliances of the manufactory, where it is afterwards executed, especially if the work is let by open tender."

The paper then comments on certain minor details of manufacture and on the rather antiquated regulations of the Board of Trade, and on the important question of rolling load speaks thus sensibly:

"For convenience the strength of bridges is usually [in England, of course; not in the United States; although the tendency in this country to return to the former practice is now decided] measured by an assumed uniform load per foot run, intended to cover the weights of the heaviest engines and trucks. The proper equivalent has often been a matter of dissension, which is not remarkable, as it varies for any given engine or combination of engines, not only with the span but also with the mode of using the equivalent itself.

"This may be seen by the diagram (not reproduced) representing the equivalent uniform load producing at any point in a beam a moment of flexure equal to or greater than that produced by a given system of loads, as is required for designing beams of which the section is varied in the usual way for all but the smallest plate girders. The diagram shows how important the rolling load becomes in small girder bridges and in the floors of large bridges, matters which have certainly not been properly considered in numerous existing examples in England. It will be seen that the equivalent load for each system varies in a somewhat erratic manner with the span; sometimes one and sometimes another determines the maximum. Hence the determination of the greatest load to which a bridge may be subjected in the manner directed by the rules leaves a considerable opening for error, and affords an excellent example of the insufficiency of any rules, however perfect, to relieve the engineer of a large amount of responsibility."

The Engineer, from whose columns we make our abstract, declares it to be "beyond the resources of the engraver's art" to reproduce the diagram in black and white, color being necessary for distinctions. It is, however, sufficiently described above to give a general idea of it.

The paper then gives a long historical critique of the rules of the Board of Trade, which we need hardly abstract, and closes with some recommendations for rules for the design of iron and steel bridges which seem eminently sensible in their suggestions for the rolling load at least, but it would be somewhat premature to now discuss in detail.

The rolling load assumed for the spans illustrated is somewhat greater than the greatest assumed by Mr. Geo. H. Pegram in his valuable paper which we reproduced and discussed in our issue of Sept. 17, and the computed weights compare singularly well with his, as the following comparative figures will show:

Comparative computed weights of 140 ft span, bridge. Iron floor system.

	By paper above.	By paper of G. H. Pegram.		
		Specification.—		
	Type V.	T.	C.	M.
	lbs.	lbs.	lbs.	lbs.
Rolling load, lbs. per ft.....	3,733	3,276	3,118	2,760
Weight { single track.....	——	178,700	177,000	171,000
Weight { double track.	348,800	339,530	336,300	324,900

The correspondence will be seen to be still closer if we remember that, although 200 lbs. per foot of track was added to Mr. Pegram's formula, as he suggests, for an iron instead of wooden floor system, yet that the floor system assumed in the above paper was somewhat heavier than any Mr. Pegram had in mind or referred to. At least, we infer as much.

The letters "T," "C," "M," above refer, we may perhaps repeat, to an assumed rolling load of a "typical" or very heavy Consolidation, an ordinary Consolidation, and a Mogul engine. We have given above only the *engine* load per foot, neglecting the following train, since two engines so nearly cover a 140-ft. span that the lighter following train has little effect to reduce the strains.

The trifling and petty economy effected by building bridges too light for durability under probable future rolling loads is clearly brought out in this table, which is one great reason why it seemed desirable to us to reproduce the diagrams and calculations. The moral is very clear, indeed, from the brief table above that there is hardly the shadow of a real justification for building such bridges as are now going up by hundreds and thousands on what are supposed to be, and are in other respects, first-class lines. This most unfortunate and dangerous tendency arises, we believe, from the fact that bridge *buyers* do not understand the intricacies of bridge-building, and have a very wrong impression that the weight of a bridge should vary nearly as the load it is proportioned for, and that the necessary cost will be nearly as the weight.

Neither of these propositions is true, and we again urge, in view of the above figures, that those responsible for the buying of bridges give this matter, as set forth more fully in our issues of Sept. 17 and Oct. 1, their careful attention. There can be no doubt that the respectable bridge manufacturers, one and all, would far prefer to furnish bridges to carry from a fifth to a third heavier rolling loads (or at least that they would do so) at but a fractional increase of cost, probably from 5 to 8 per cent. for the more usual spans, if they could but be assured of competing *on equal terms* for such structures. When they have constantly before them, however, the fear that the value (and in fact vital importance) of having bridges considerably stronger than will *barely* suffice to carry the trains then in use, will not be recognized by even a fractional increase of price, they are naturally disposed to conform the supply to the demand by furnishing just the article that their customers seem most ready to buy at the lowest possible cost to themselves.

The Impediments to Good Practice in Laying Ou Railroads.

[From the introduction to the forthcoming new edition of "The Economic Theory of the Location of Railways," by A. M. Wellington, C. E.]

It would be well if engineering were less generally thought of, and even defined, as the art of constructing. In a certain important sense it is rather the art of not constructing; or, to define it rudely but not in aptly, it is the art of doing that well with one dollar, which any bungler can do with two after a fashion.

There are, indeed, certain great triumphs of engineering genius—the locomotive, the truss bridge, the steel rail—which so rude a definition does not cover, for the bungler cannot attempt them at all; but such are rather invention than engineering proper. There is also in some branches of engineering, as in bridge-building, a certain other side to it, not not covered by such a definition, which consists in doing that safely, at some cost or other, which the bungler is likely to try to do and fail. He, therefore, in such branches, who is simply able to design a structure which will not fall down, may doubtless in some measure be called an engineer, although certainly not one of a very high type.

But to such engineering as is needed for laying out railways, at least, the definition given is literally applicable, for the economic problem is all there is to it. The ill-designed bridge breaks down; the ill-designed dam gives way; the ill-designed boiler explodes; the badly built tunnel caves in, and the bungler's bungling is betrayed. But a little practice and a little study of field geometry will enable any one of ordinary intelligence, without any engineering knowledge whatever in the larger sense, to lay out a railway from almost anywhere to anywhere, which will carry the locomotive with perfect safety, and perhaps show no obtrusive defects under what is too often the only test—inspection after construction from the rear end of a palace car. Thus, for such work, the healthful checks which reveal the bungler's errors to the world and to himself do not exist. Nature, unhappily, has provided no way for the locomotive—like Mr. Jingle's intelligent pointer—to refuse to pass over an ill-lesigned railway as it refuses to pass over an ill-designed bridge.

Therefore, since there is no natural line between safety and danger to mark even so rude a distinction as that between the utterly bad and the barely tolerable, in the kind of engineering work we are to study, one may fairly say that the locating engineer has but the end before him to justify his existance as such—to get the most value for a dollar which nature permits; and but one failure to fear—that he will not do so. Except as his work necessarily involves the preliminary design of constructive details, he has no lives to save or imperil; and the young engineer cannot to early nor too forcibly have it impressed upon his mind that it takes no skill worth speaking of to do such work after a fashion, except in the comparatively few cases (rare indeed in the United States) where to get a reasonable line of any kind is something of a feat. His true function and excuse for being as an engineer, as distinguished from a skilled workman, begins and ends in comprehending and striking a just balance between topographical possibilities, first cost, and future revenue and operating expenses.

While this, in a certain sense, is peculiar to the branch of engineering we are to study, yet a curiously close analogy may be drawn, tending to show that it is as essentially true of all other branches of engineering as of this. For example, it is beyond doubt that the true reason for the striking progress in bridge-building in recent years has been, not that men have been driven into excellence by "the responsibility of human life" resting on them;—for, after the types have once been invented, a relatively low order of engineering skill suffices to reduce that risk alone to a minimum. But the impelling force has been the keen competitive struggle to bring the first cost of every bridge as low as possible, and yet do nothing which shall injure its permanent efficiency and compel it to be speedily rebuilt; nothing, in other words, which shall increase the future "maintenance and operating expenses." But whereas the "operating expenses" of bad bridge-engineering come in a series of startling catastrophes which shock the community and dismay the moneyed interests concerned, causing good work to be appreciated and insisted on, and scaring off the amateurs and 'prentice hands from "meddling and muddling," after the manner of their kind, the operating expenses from bad railway location come by a gentle but unceasing ooze from every pore which attracts no attention, albeit resulting in a loss vastly larger than any possible loss from bad construction; for it requires some training and experience even to appreciate the loss as existing, and still more of both to appreciate it as remediable. In fact no one can do so, except in the most general way, without special investigation of each special case. Errors which, even if committed, are not likely to be discovered, are rarely much feared, and at last the consciousness that there is danger of error becomes dulled.

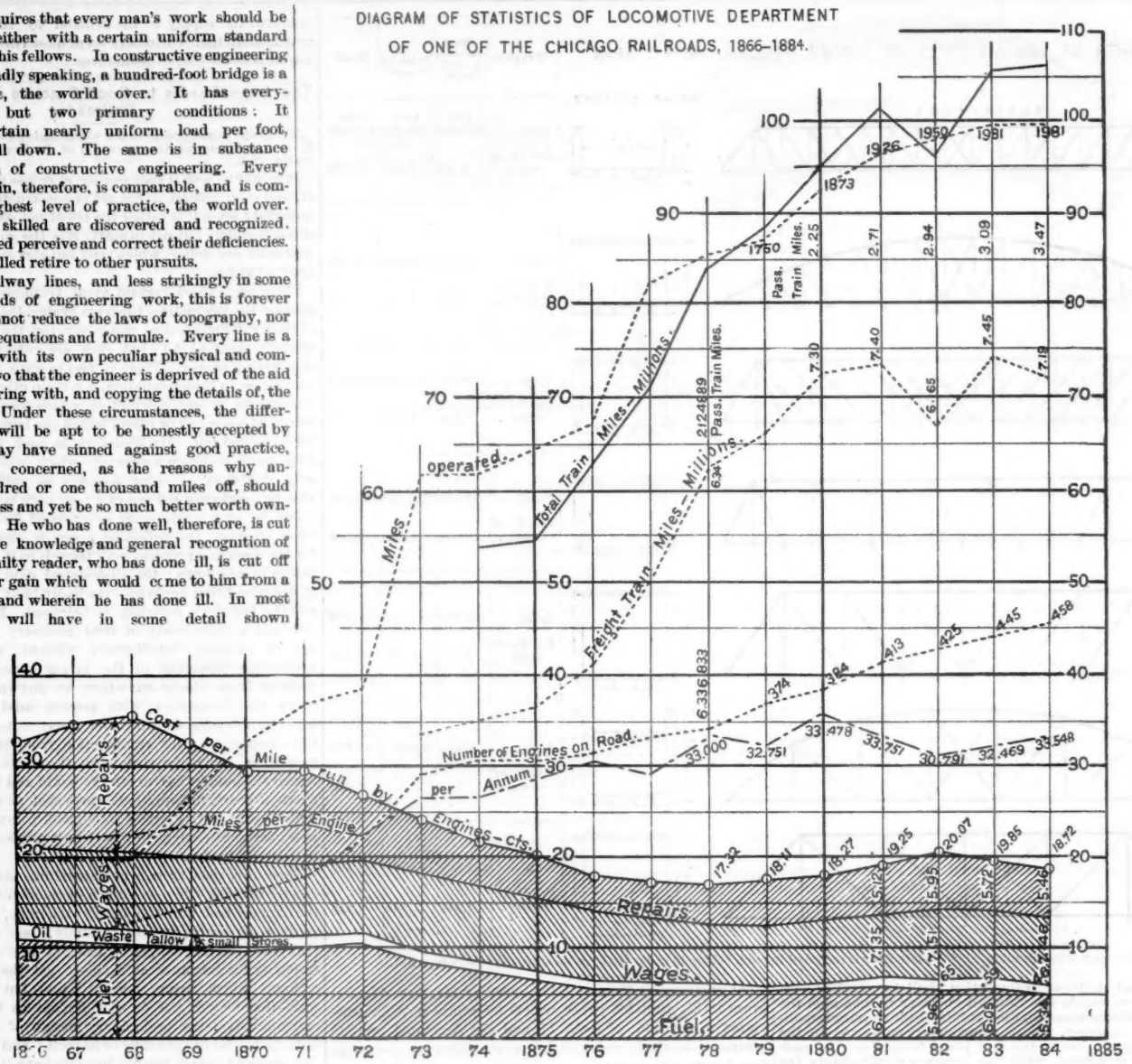
In these facts we have plain reasons while average practice in laying out railways should invariably tend, as it does tend, to be and remain of a low grade. It is not difficult, in fact, to see reasons why it can never well be otherwise, except in degree, unless the progress of science should wholly change the nature of the work; and a correct appreciation of how great is this danger, and why it exists, will greatly help to save the student from it.

The permanent difficulty lies in this: High efficiency in any art or calling in which many minds of no phenomenal

gifts are engaged requires that every man's work should be readily comparable either with a certain uniform standard or with the work of his fellows. In constructive engineering this is possible. Broadly speaking, a hundred-foot bridge is a hundred-foot bridge, the world over. It has everywhere to fulfill but two primary conditions: It must carry a certain nearly uniform load per foot, and it must not fall down. The same is in substance true of every form of constructive engineering. Every man's practice therein, therefore, is comparable, and is compared, with the highest level of practice, the world over. Those most highly skilled are discovered and recognized. The moderately skilled perceive and correct their deficiencies. The hopelessly unskilled retire to other pursuits.

In laying out railway lines, and less strikingly in some other analogous kinds of engineering work, this is forever impossible. We cannot reduce the laws of topography, nor even of finance, to equations and formulæ. Every line is a problem by itself, with its own peculiar physical and commercial conditions, so that the engineer is deprived of the aid to be had by comparing with, and copying the details of, the practice of others. Under these circumstances, the difference of conditions will be apt to be honestly accepted by the reader who may have sinned against good practice, and by all others concerned, as the reasons why another line, one hundred or one thousand miles off, should have cost so much less and yet be so much better worth owning than his own. He who has done well, therefore, is cut off from any absolute knowledge and general recognition of that fact, and the guilty reader, who has done ill, is cut off from the still greater gain which would come to him from a revelation of where and wherein he has done ill. In most such cases each will have in some detail shown

DIAGRAM OF STATISTICS OF LOCOMOTIVE DEPARTMENT
OF ONE OF THE CHICAGO RAILROADS, 1866–1884.



better judgment than the other; but from the lack of unquestionable evidence of this, each is denied the instruction which he might otherwise receive from that fact, and so is in great danger of falling into at that most natural and most human error, believing that all that he has done which has not been proven to be bad is good, and so ceasing to make effort to improve upon what is good enough to pass, and merely multiplying errors with advancing experience, without really advancing in knowledge.

In other words, the student should begin with the consciousness that the level of average practice in railway location, his own included, is by its nature restricted, not to the sum of the united abilities of all those who are or have been engaged in it, as in constructive engineering, but to the average individual level of capacity and knowledge. No more is needed than this undoubted fact to prove to demonstration that average practice is and must be, both comparatively and absolutely, of a pretty low grade; and hence it becomes every one who may be intrusted with such work to have constantly before him the fact that he stands thus alone, and to scrutinize the conclusions which he may reach with the sternest skepticism, remembering that his danger of grave errors of judgment is thereby multiplied many fold. As he measures only by his own knowledge, all the work he does will naturally seem good even if really bad.

To the preceding, which may be called the subjective obstacles to good practice, must be added another and perhaps a greater one. Inasmuch as no one can even know for himself the absolute quality of his own skill in this particular branch of engineering, it is almost a natural corollary that corporations should very uniformly decline to take it for granted, by assuming that there are any measurable differences in qualifications for such work among those who have proved their competency in other branches of engineering. Hence it happens that railway location tends more and more to be entrusted to those to whom it is a mere temporary incident in their professional career, and who consider the work mainly from the constructive standpoint, without much attention to those larger economic questions which it is the purpose of this volume to discuss, and to which, in well-conducted work, the mere constructive details should be wholly subordinate. But as the inexperienced young man can only gauge the importance of various work by the attention which he sees paid to it by his superiors, he is, as it were, pushed by others into an error which it is difficult for him to avoid at best; for he will soon note that the assumption and practice of the world is, that whoever is fit to design the structures of a railway is thereby fitted without further study or preparation, to design the railway as a whole. In fact, this vicious principle is in very many instances pushed to the absurd extreme of entrusting engineers of inferior capacity with the location of railways, and only seeking for a higher grade of skill when the design of the cheaper man is to be embodied in construction. The error in so doing is the same in kind and in degree as if it were assumed that whoever was fitted to build a house was fitted to design one. The mental qualities and special training needed are much the same in each case, but the two kinds of work are distinct, and skill in one does not argue skill in the other.

Nevertheless, railways must be built, and fortunately there is a bright side as well as a dark side to the picture. There is indeed a pitiable waste resulting from the conditions outlined: such, to mention a simple and readily comprehended example, as has resulted from the location of the entire railway system of the prairie states of the West—taking it as a whole and neglecting the many individual exceptions—where the fatal ease with which an air-line may be run from almost anywhere to anywhere, by using heavy enough grades, has brought the average train load lower than in the rugged regions of the East, and caused perhaps a greater percentage of utterly needless waste, and a more discreditable aggregate of thoroughly bad location, than in any other considerable region of the world; and in view of such facts, the distorted pre-eminence given by engineers, and by those who teach them and employ them, to the pettiest details of *how* to build the separate works which make a railway, to the neglect of the larger questions of where to build and when to build, and whether to build them at all, has in it something at once astounding and discouraging. But in a larger view this is in no way surprising. It is but the common result of man's attempts at solving every serious problem which does not admit of exact and positive solution, like a problem in geometry, but contains such indeterminate elements that to solve it perfectly is given only to Omniscience. In all such cases mankind in general shirks the issue, or jumps at a solution in the rudest way, as is seen not only in the work of engineers, but in that of farmers and legislators and merchants, physicians and builders. Compaired with the dismal failure which so many men make in every one of these callings, the work of engineers in laying out railways shines by comparison. For after all, the fact, if it be a fact—as in a rude way it is—that what between waste in construction and waste in operation and waste from inaccessibility to possible patrons, it takes about twice as great expenditure of capital and labor as it need to afford existing transportation facilities—this really means no more than that, instead of realizing 90 per cent. of the advantages which might be gotten from George Stephenson's invention, as is reasonably possible, only some 79 or 80 per cent. is actually realized. The great world declines to take much interest in such a trifling waste as this, being accustomed to much greater waste in many things, and having something of that large indifference to waste which pervades all nature. Nor would it be worth while here to insist on it for the mere sake of pointing out that it exists, but solely to point out that, as the location of railways is the one department of engineering in which waste on a gigantic scale is possibe from probable errors of judgment, and as it is likewise the one department of engineering in which no natural check exists against such errrors, it is fitting that engineers should prepare themselves for it with especial care, at least to the extent of acquiring an adequate conception of the number and magnitude of the errors into which they may fall.

Diagram of Locomotive Statistics.

The interesting diagram which we present in this issue is of value not only for the information which it gives directly, but as an illustration of a method by which much more clear ideas can be obtained of the course of expenses or traffic than by any amount of figures. A "9" is no bigger than a "2" in type, and it requires a very considerable mental effort to picture correctly the relative magnitude of the quantities they stand for. In fact, it can hardly be done at all by the average man. On the other hand, when we have a line 2 in. long and a line 9 in. long side by side, we see at once their exact relation to each other without any effort at all.

When we have to compare, not two lines only, but 19 different lines for each one of the nine different things which are given together on this diagram, the advantage of the diagram over figures becomes immense, and any managing officer will find it very instructive to prepare such diagrams covering many years past for the departments under his charge. He will be at once repaid by the indications which it will give him of the gain or loss of efficiency or economy in different details.

For example, the course of the locomotive expenses is shown by the shaded parts of the diagram in a very interesting way. Alone of all the items, wages, it will be seen, have remained practically uniform. There was a slight tendency to decrease during the hard times of 1877-79, but they have since recovered, and are now substantially what they were 20 years ago.

The cost of fuel declined sharply after 1872, but since 1876 has been nearly uniform. Two possible causes for this are indicated on the diagram, both of which probably had their effect. One was the increase in miles operated, which probably tended with other obvious and known causes to reduce

the cost of coal, but another and probably very important contributing cause was the increase in miles run per engine per year, which likewise began simultaneously, and ceased to advance sharply after the cost of fuel ceased to decrease. Unfortunately, the pounds of coal burned per train mile, car mile and ton-mile are not given. That the cost of fuel should have remained so nearly uniform of late years in spite of the known great increase in average train load speaks well for the economy of management.

The course of cost of repairs is very instructive. It will be seen that the decrease has been enormous, and it is, doubtless, in great part due to natural and permanent causes, such as the decrease in cost of materials and better shop facilities. But it needs but a brief glance at the line showing "Number of engines on road," in connection with the cost of repairs, to detect another explanation of vast importance in its effect on operating expenses, which is too little remembered in studying maintenance charges, viz.: the enormous and continuous infusion of "new blood" into the locomotive stock. From 1866 to 1871 the stock was nearly doubled; from 1871 to 1873, increased 50 per cent., and from 1873 increased less rapidly in proportion, but still largely each year, so that there has been at all times in the past a very large number of new locomotives in the stock *in addition* to the proportion naturally required to replace old engines worn out. As new engines cost comparatively little for repairs, it is inevitable that this abnormal proportion of new engines should greatly affect the average cost of repairs, and it is very clear that it has done so. The very small expense for repairs in 1875-9 was not wholly due to economies enforced by hard time, although no doubt largely so, but in great part to the fact that there were a greater proportion of new engines in service than at any time before or since. Since then, the inevitable increase has come about, in spite of heavy falls in the cost of much of the material used, due to improved processes of manufacture and cheaper transportation, and should the continual additions of new stock stop, it is very certain that the increase must go still further. It is to be remembered also that these nominal "repairs" do not include many incidentals for maintenance of shops, etc., which are really a part of the cost of repairs, but not ordinarily included in it. Comparatively, however, these figures are doubtless correct. A chief reason for the heavy decline since 1866 is undoubtedly the continued improvement in the character of the road-bed and in the quality of the workmanship and material used.

The increase in the average miles run per engine is a most creditable record, and it would seem one not likely to be much further improved on, since an *average* of nearly 100 miles per day for every day in the year and for all engines must nearly reach the possible limit. It implies that single engines have more than doubled this. An interesting fact is the decrease in miles run and simultaneous increase in cost of repairs per mile run in 1882, which can hardly be an entirely accidental coincidence.

Many details which it would be desirable to have on such a diagram as this are not on it, but there is enough to show that much instruction and profit might be obtained, in a very easy way, by the more general construction and study of such diagrams.

THE SCRAP HEAP.

A Terrible Accident.

A dispatch from Cincinnati, Nov. 28, says: "A fatal collision attended by dramatic circumstances occurred at at Anderson station, on the Cincinnati Southern Railroad, eight miles below here this afternoon. An engine making a trial trip was in charge of Edward Drohan, an old experienced engineer. At Andersons it collided with a northbound freight. Drohan had in the cab his two sons, five and seven years old, and also John Maher, aged five. Perceiving the danger ahead, he threw the three children through the cab window, stayed at his post and was killed. John Maher was also killed, and Frank Lockwood, engineer of the northbound freight, badly injured."

A Singular Accident.

A dispatch from Mt. Carroll, Ill., Nov. 26, says: "Upon the arrival of freight train No. 13, on the St. Paul road at this place, smoke was discovered issuing from a car in the body of the train. Investigation proved that the car contained M. V. Seavey, from West Libertyville, Ill., several horses, fowls and furniture, billed to Dows City, Ia. A lot of hay in the car was found to be on fire, evidently ignited by a lantern which was discovered broken on the floor. The stock were dead, suffocated by the smoke, and Mr. Seavey was found on his knees near the door of the car living, but so much overcome that he breathed only a few minutes after being taken out. Seavey was about 50 years of age."

Fast Cross-Country Travel.

A correspondent sends us the following instance of actual cross-country travel: A friend recently made the trip from Washington, D. C., to Urbana, Ill., in 25 hrs. 18 min., allowing for difference in time. Route, Baltimore & Ohio to Cincinnati; Cincinnati, Indianapolis, St. Louis & Chicago to Indianapolis; Indiana, Bloomington & Western to Urbana. This is at the rate of a little over 31 miles per hour, including all stops and two changes of cars, the last 117 miles on a local train.

Picked-Up.

A Vermont railroad engineer who refused to "die heroically at his post" explained to a reporter that his wages had been cut down 10 per cent., and he couldn't afford to. When he thought of his wife having less than $5 in the house, with a large family needing shoes right away, he felt it his duty to live on.—*Providence Journal.*

A hotel clerk says that railroad officials and actors are the nicest people to get along with. They always know what they want, don't quarrel about their bill, tip the bell boys and waiters and are no trouble to anybody. The hotel clerk is very complementary, and this unsolicited tribute is greatly to his credit, provided he isn't laying his pipes for free passes and deadhead tickets.—*Boston Transcript.*

The Accident at Bardwell's Ferry.

Trial Justices Bardwell and Dana filed in the Clerk's office at Greenfield, Mass., Nov. 27, their findings in the case of the accident at Bardwell's Ferry (West Deerfield), on the Troy & Greenfield road, April 7, last. The paper is accompanied by a diagram, and states at great length all the facts concerning the accident. The conclusions drawn from the inquest, as stated in the report, are given below, and it will be seen that the finding is entirely different from that of the Railroad Commissioners, who traced the trouble to the rotten cribwork:

"At an inquest holden before the subscribers, Trial Justices within and for said county of Franklin, at Greenfield, on July 29, which inquest was continued July 30, Aug. 2, Aug. 13 and Sept. 29, to inquire into the cause and manner of the death of Merritt Seelye, E. E. Hayden, J. R. Guild, E. F. Whitehouse, Viola R. Littlejohn, Otis H. Littlejohn, Herbert Littlejohn, Mark F. Spencer, C. H. Dugan, C. A. Temple and A. K. Warren, whose dead bodies have been found lying in said Greenfield and in Shelbourne, we, the said Trial Justices, having heard and considered all the evidence in the case, report as follows: The deceased came to their death by an accident on the Troy & Greenfield Railroad on the evening of April 7, 1886. The accident occurred in the town of Deerfield, at a place where the road winds along the Deerfield River upon a high, steep embankment. The road-bed to this point is about 101 ft. above the river, and distance from the stream about 175 ft. Directly above and to the north of the road is a cliff 60 ft. high. The work of grading the road-bed at the place of the disaster was done by Haupt & Co., in 1860-61, by blasting out rock to a width sufficient for a single track. The contractor who completed the road in 1866-67 did no work of grading or of widening at this place, but laid the track upon the roadbed of solid rock, as blasted and graded by Haupt & Co. To repair the damage caused by the freshet of October, 1869, cribs of wood were constructed for the purpose of protection from the wash of the river, a temporary support to the embankment; such a crib of logs was put in at the place of the accident; lying about 25 ft. from the water's edge, it extended from 60 to 75 ft. along the bank. * * * There was no culvert near the place of the accident, and all the water which came down the cliff into the ditch flowed a distance of nearly 900 ft. to the west before reaching an outlet. The nearest culvert toward the east was distant 600 to 700 ft. The lack of suitable culverts was, in our judgment, a source of weakness and danger at the particular place where the accident occurred. * * * There was no evidence of any displacement of the embankment except at the top, and extending down abont 8 ft., and no evidence that the settling was in any way connected with the crib, which was over 100 ft. distant down the slope. There had been a series of warm days, with a heavy fall of rain on the previous day. A large volume of water had poured down the cliff, washing down a quantity of soil from the ledge, and partially filling the ditch, and we conclude that the water, having no sufficient outlet, forced its way through the gravel used as ballast under the track, and caused the sudden giving away of the track and road-bed under the pressure of a heavy train running at high speed."

TECHNICAL.

Locomotive Building.

The Lehigh Valley shops at Wilkes-Barre, Pa., have just completed a locomotive of the Strong pattern for the road.

The Canadian Pacific shops in Montreal are building four consolidation freight locomotives, with 19 by 22 in. cylinders and 51-in. drivers for the road. The first one is completed, and is said to be the first consolidation engine built in Canada.

The Dickson Manufacturing Co. of Scranton has its locomotive shop full of work. It is building some engines, American type, for the St. Louis, Arkansas & Texas. These engines are fitted with the Pearson equilibrium slide valve, which has been used for some five years on several locomotives at work near Scranton, and is said to give good results. The boilers are lagged with asbestos and plaster of Paris.

The Car Shops.

The Terre Haute Car Co., in Terre Haute, Ind., has recently closed contracts for 1,500 box, flat and coal cars, and enough work is now on hand to give steady employment to the entire force till April 1. Among the contracts received is one for 500 cars for the Wheeling & Lake Erie; also one for 250 box cars for the Cincinnati, Hamilton & Dayton. Another calls for 175 coal cars for the Kansas City, Fort Scott & Gulf.

The Lehigh Car and Manufacturing Co. in Stemton, Pa., recently shipped a number of ore cars to the Juragua Mining Co. in Cuba.

The Anniston Car Works in Anniston, Ala., are to be started up on several contracts for freight cars recently made.

The Gilbert Car Co., of Troy, N. Y., has leased the Jones Car Works at Schenectady, N. Y., for four years at $5,000 per year, with the option of purchasing the plant for $59,500 at any time six months prior to the expiration of the lease, which the lessor is privileged to terminate if the lessee at any time employs less than 25 men for six consecutive months, except it be as the result of a strike.

Bridge Notes.

W. G. Coolidge & Co., in Chicago, have been awarded the contract for a double track iron draw-bridge over the Chicago River at North Chicago, for the Chicago & Northwestern; also for all the Truss Bridges on the new Penokee Line of the Wisconsin Central Railroad.

The Smith Bridge Co. in Toledo, O., is building a highway bridge at New Orleans.

The Wrought-Iron Bridge Co., in Canton, O., has the contract for an iron highway bridge in Delaware County, O., near Trenton.

Manufacturing and Business.

The Dickson Manufacturing Co. in Scranton, Pa., last week shipped a pair of hoisting engines to Japan, for use in the Meik Imperial colliery. The engines are about 300 nominal H. P., with cylinders 20 by 48 in. The engines are accompanied by steel drums and all the different parts and fixtures, all ready for putting up. They are sent to New York, and from there are shipped by steamer to the port of Nagasaki, Japan. The total weight, including drums, etc., is 65,000 pounds. The firm is also now at work on a pair of hoisting engines and drums for the Crown Point Ore & Iron Co., of Crown Point, N. Y. The engines are of 200 nominal H. P., and have cylinders 16 by 30 in. in size.

The Buffalo Scale Co. in Buffalo, N. Y., is supplying a number of its standard scales to the Lake Shore & Michigan Southern road.

The Wainwright Manufacturing Co., Boston and New York informs us that there is a press of orders on hand, especially for feed-water heaters. The business for the past year has been large; a prosperous winter's trade is indicated.

The foundry of the Westinghouse Machine Co. at Pittsburgh, and the malleable iron works of McConway, Torley & Co., were destroyed by fire Nov. 14. The latter firm is rebuilding in another location, and the Westinghouse Machine Co. has secured the entire block, on which they will erect a new foundry and other buildings. The works of this company now cover nearly three blocks of ground.

Mr. George Westinghouse has just purchased a piece of ground at the corner of Penn avenue and Ninth street, Pittsburgh, on which to erect an imposing office building. The property has a frontage of 80 ft. on Penn avenue and extends back along Ninth street 110 ft. to Exchange alley. The price paid was $78,000, being almost $1,000 a foot. The new building will cost at least $200,000, and will be eight stories in height. Pressed brick, with terra-cotta finish, is the material to be used. The building will contain all the offices of the Philadelphia Gas Co. and all Mr. Westinghouse's other offices, including the Westinghouse Air Brake Company, the Union Switch & Signal Co., the Westinghouse Machine Co., the Westinghouse Electric Light Co. offices, Westinghouse, Church, Kerr & Co. and the Safety Appliance Co. The edifice will be known as the "Westinghouse Building," and it is expected to be ready for occupation next July.

Iron and Steel.

The Sloss Iron & Steel Co., a new organization, has bought the Sloss Furnace property at Birmingham, Ala., for $2,000,000. The property embraces two furnaces of a daily capacity of 222 tons and 250 coke ovens, 45 miles of red iron veins at Red Mountain, 15,000 acres of brown hematite ore lands, and two extensive lime rock quarries.

The Bay State Furnace at Port Henry, N. Y., was sold at referee's sale last week, and bought in for $75,000 by F. S. Witherbee.

The Thompson Steel Works in Jersey City, N. J., are to be removed to Scranton, Pa., it is said.

The Linden Steel Co., Limited, of Pittsburgh, has commenced to build an open-hearth furnace at the works. Its capacity will be 35 tons a heat.

Fannie Furnace (coke) in the Shenango Valley, Pa., which is being relined, will blow in about December 10 next.

The Rail Market.

Steel Rails.—The market continues firm, and quotations are $35 per ton at Eastern mills. It is said that $35.50 has been asked on small orders, and a higher price is talked about.

Rail Fastenings.—The market is firm and active. Spikes are quoted at 2.40 cents per lb. in Pittsburgh; track-bolts, 2.90@3.10 and splice-bars, 1.80@1.90.

Old Rails.—The market for old iron rails is still active, with quotations at $22@$23 per ton at tide-water. Old steel rails are still scarce, and are quoted at $23@$25.50 per ton in Pittsburgh, according to length.

Car Doors.

The Dunham Manufacturing Co. of Boston have filled late orders for their "Paragon" car-door hangers as follows: For 500 Lehigh Valley cars; 125 Boston & Albany cars; 50 baggage cars by Jackson & Sharp Co.; beside other orders by the Chicago & Alton Railroad Co., the Laconia Car Co. and the Bradley Car Works.

Boiler Scale in Illinois.

Mr. A. T. Woods, Assistant Engineer U. S. Navy, sends us the following from Champaign, Ill.:

"As an example of boiler scale in this part of the country, I noted recently in a repair shop yard in this vicinity, a partially broken up locomotive fire-box in which the scale on side sheets was from $\frac{1}{16}$ in. to $\frac{3}{8}$ in. thick. The crown-sheet was curved and braced by crown bars. The spaces between each bar and each pair, as well as between bars and crown-sheet was *solid* with scale, apparently caused by fragments lodging there and being cemented together. Fire-box heating surface must have been valuable on that locomotive during its last runs. Such a sight may be a common one to Master Mechanics, but there is in it food for thought for designers."

Engraved Certificates.

The London Stock Exchange has followed the action of the New York Stock Exchange in deciding to accept certificates engraved by the Homer Lee Bank Note Co., of listed stocks and bonds as good delivery.

Car Inspection at Cincinnati.

A meeting was held in Cincinnati, Nov. 27, at which there were present representatives of all the lines entering that city. At this meeting, after a general discussion, it was decided to appoint a general car inspector for all the roads, with authority to decide all matters in dispute between the car inspectors of the different roads as the repairs of cars and the liability of the companies under the Interchange Rules. The choice of a car inspector was deferred until this week, when another meeting will be held.

The Westinghouse Electric Light.

The first commercial installation of this new system of electric lighting has just been completed at Buffalo, where a large store is lit with over 400 incandescent lamps, some of which are of 150 candle-power. A Stanley dynamo of 500 horse-power is employed. The light given is steady and brilliant. The essential features of the system were clearly explained in a recent number of the *Railroad Gazette.*

Foot-Guards for Frogs and Switches.

A recent accident at Portland, resulting in the death of an employé of the Portland & Ogdensburg Railroad, calls to mind an act passed by the last Legislature of Massachusetts. The accident in question was occasioned by the man catching his foot in a frog and an engine running over him while in that helpless condition. There have been many such accidents in this state, but in the future they will be impossible, for the Legislature passed a law providing that "every railroad corporation operating a railroad or a part of a railroad in this commonwealth shall, before Jan. 1, 1887, adjust, fill or block the frogs, switches and guard-rails on its track, with the exception of guard-rails on bridges, so as to prevent the feet of its employés from being caught therein. The work shall be done to the satisfaction of the Railroad Commissioners, evidenced by the certificate of their Clerk. Any railroad corporation failing to comply with the provisions of this act shall be punished by a fine of not less than $100 nor more than $1,000." The law did not specify any particular style of block to be used, and as there are several inventions which have proved efficient in "preventing the feet of employés from being caught" in frogs, the only question for railroad managers to consider is that of expense.—*Boston Herald.*

A Cable Railroad in New York.

A new cable railroad was opened to the public in New York Dec. 1. The new road is a cross-town line running from the East River to the North River on 125th street. It is owned by the Third Avenue Railroad Co. The machinery was furnished by the Jonson Foundry & Machine Co., of New York.

Railroad Weather Service.

A dispatch from Omaha, Neb., says: "The Union Pacific has completed arrangements to establish a weather service over its entire system similar to that in use by the Federal government. There are to be 32 stations. Nine will be first-class stations, equipped with a full set of observing instruments. There will be nine second-class stations. Two observations will be made each day, at 4 a. m. and 4 p. m., and reported to headquarters at Omaha. Trains will be equipped and operated according to the weather reports. The officer to be put in charge of this system is Lieut. Joseph S. Powell, of the government Signal Service. His salary is to be paid by the government. All other expenses will be borne by the railroad company. The Chicago & Northwestern and the Central Pacific have been invited to co-operate with the Union Pacific so as to make a through railway weather service between San Francisco and Chicago."

RAILROAD GAZETTE

Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE NEW YORK, LAKE ERIE & WESTERN.

The report of the directors for the fiscal year ending with September last, so far as earnings and expenses are concerned, adds to the information already published only the results in September, full monthly reports having been issued for the other 11 months. The report for those months showed an increase of $2,494,332 in gross and of $1,478,572 in net earnings. September added $325,707 to the increase in gross earnings, but it reduced the increase in net earnings $274,361, the amount charged to working expenses in that month being immensely greater than in any other month—perhaps because expenditures not previously distributed had to be charged in the last month of the year. For the whole year the earnings and expenses of the Erie proper have been :

Year to Sept. 30.	Gross. earn.	Expenses.	Net earn.
1886	$18,310,495	$12,279,407	$6,031,088
1885	15.490,456	10,663.579	4,826,877
1884	17.618.977	12,069,938	5,549.039
1883	20,598,572	13.578,700	7,019,872
1882	19,975,774	13,088.094	6,887,680
1881	20,715,605	13,,956 230	7,459,375
1880	18.693,109	11.643.925	7,049,183
1879	15,942.023	11,174.699	4,767.324
1878	15.644.978	10,635,864	5,009.114

Thus the gross earnings, though so much larger last year than the year before, were less than in any of the four years from 1880 to 1883, and the net earnings were also less than in any of those four years. Compared with 1884–85 the increases this year are :

In gross earnings	$2,820,039, or 18.3 per cent.
In expenses	1,615,828, or 15.1 " "
In net earnings	1,204,211, or 25.0 " "

All but a small part of this great increase in earnings was in freight earnings, due to a great increase in traffic, especially in coal traffic, together with an advance in the average rate received.

For what made the year 1884–85 so extremely unfavorable to this and other lines similarly situated, was not only the very low rates of the railroad war, but a great reduction in traffic in spite of the low rates. The amount of freight traffic on the Erie proper (excluding the New York, Pennsylvania & Ohio) has been in ton-miles :

Year to Sept. 30.	Coal.	Other freights.	Total.
1886	963,170,998	1,095,223,020	2,058,394,022
1885	705,276,525	982,,70,163	1,687,546,688
1884	676,180,627	1,118,766,492	1,794 946,519
1883	640,491,106	1,338.957,322	1.979.448,428
1882	611,078,125	1,343,313,585	1,954.389,710
1881	574.533,237	1,409.801 618	1,984.394,855
1880	432,329,839	1.288,782,256	1,721,112,095
1879	500,436,551	1,068.785,866	1.569,222,417
1878	267,344.580	957,419.1 8	1,224,763,718

Thus the total freight traffic, which increased with great rapidity from 1878 to 1881, and remained for three years about on the high level then reached, fell off, after the opening of the Lackawanna's line alongside of the Erie's main line, 9 per cent. from 1883 to 1884, and after the opening of the West Shore 6 per cent. from 1884 to 1885, making a reduction of 15 per cent. from 1883 to 1885, with, at the same time, a reduction from 0.786 to 0.656 cent per ton per mile (17 per cent.) in the average rate received. In a single year this great decrease in traffic for two years has been more than made good. The average rate has increased over 1885 10½ per cent. on coal, and 9 per cent. on other freight, yet the average rate on all freight was as low as in 1885, which apparent anomaly is explained by the fact that the coal traffic, on which rates are nearly a third less than on other freight, was a very much larger proportion of the whole than in 1885, namely, 47 per cent. against 41¼ per cent.

The increase last year over the year before was 258 millions of ton-miles (36½ per cent.) in coal traffic and 113 millions (11½ per cent.) in other freight. This makes the coal traffic much greater than ever before, but the other freight less than in any of the five years from 1880 to 1884. The increase in the coal, however, has been so very great as to more than counterbalance the decrease in other freight, which latter was largely the result of the opening of new lines between New York and Buffalo, and the total ton-mileage was larger last year than ever before—22 per cent. more the year before, but only 4 per cent. more than in 1883.

The growth of the coal traffic on this road has been one of the most remarkable traffic developments that has occurred on Eastern railroads for many years. The figures for the ton miles above are supplemented below by a statement of the number of tons hauled, as follows :

Year.	Tons.	Year.	Tons.
1877–78	2,850,106	1882–83	6,580,820
1878–79	4,410,527	1883–84	6,375,319
1879–80	4,067,574	1884–85	6,137,242
1880–81	5,518,850	1885–86	8,008,158
1881–82	6,104,672		

The Erie, which at the time of the re-organization in 1877 was one of the least important of the coa carriers, is now one of the most important. The Reading handles many more tons of coal, but its ton-mileage last year was not 30 per cent. larger than the Erie's (1,246 millions against the Erie's 963); the coal and coke shipments on the Pennsylvania Railroad Division of the Pennsylvania (which in extent is most nearly equivalent to the Erie) were about a fourth more tons than on the Reading, and it has a very short haul on much of it, which goes to works near the mines, though it has also very large through shipments, and is doubtless the greatest of the coal carriers. The average haul on the Erie last year was 120 miles, which was greater than ever before, indicating larger through shipments to the West. The average coal haul for successive years has been 97, 106, 115 and now 120 miles.

This, which proves to be the most rapidly growing traffic of the Erie, is not the most profitable. Even last year the average earnings on it were but 0.537 cent per ton per mile, which can leave but a small profit. It is, however, often carried at small expense, filling cars which would otherwise have to be hauled empty, and its aggregate effect on profits is doubtless much greater than the rates would indicate.

The directors' report, which is all that is published as yet, gives no statement of the passenger mileage last year. The number of passengers increased .6 per cent., and the passenger earnings increased $337,064 (11 per cent.); but as through passenger fares were much higher than in 1885, and the lower rate by the Baltimore & Ohio affected the through travel of the Erie more than that of any other road, probably, it is not probable that the passenger mileage increased as much as the number of passengers, and it is quite possible that it did not increase at all, or even that it decreased, a large increase in the number of short-distance passengers being offset by a decrease in the number of long-distance passengers. The passenger and freight earnings in successive years have been :

Year to Sept. 30.	Coal.	Other freight.	Passengers.	Total.
1886	$5,167,084	$8,315,732	$3,443,782	$18,310,495
1885	4,154,079	6,915,182	3,106,708	15,490,456
1884	4,554,743	8,469,519	3,698,891	17,618,076
1883	4,855,933	10,706,208	4,134,971	20,598,572
1882	4,939,373	9,702,755	4,384,510	19,975,774
1881	4,853,427	11,126,149	4,041,267	20,715,605
1880	3,191,617	11,199,498	3,682,951	18,693,109
1879	3,184,211	9,049,270	3,118,944	15,942,023
1878	2,106,479	9,808,011	3,070,121	15,644,978

It is the coal traffic, therefore, that has brought the earnings up so near to those of the years previous to 1884; for while the other freight last year yielded $1,400,000 more than in 1885, it yielded less than in any other year since the reorganization, and 22 per cent. less than in 1883; and the passenger earnings were less than in any year since 1879 except 1885. The earnings from coal, which were but 13½ per cent. of the total earnings in 1878, have been since :

1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
13.5	20.0	17.0	23.4	25.0	23.6	25.9	27.0	28.2

The passenger earnings are a smaller proportion of the whole than on any of the other leading trunk lines, though but little less than on the Pennsylvania, amounting last year to but 18.8 per cent. of the whole.

The working expenses last year were very much larger than in 1885, but much less than in the three years 1881, 1882 and 1883, when the traffic was about the same as last year. We have been accustomed to examine the expenses with some care, as it is possible and often necessary to make the expenditures for maintenance quite different in different years, sometimes much less and sometimes much more than the average yearly requirements. For several years maintenance expenditures were naturally below the average, on account of the extensive renawals of rails, ties, etc., and the immense purchases of new rolling stock shortly after the reorganization. Later, when the repairs were needed, the company's resources were so reduced that the least possible expenditures were made, and in 1883-84 the average expenditure for repairs per freight car was but $22, while on the New York Central in the same year it was reported as $50, and on the Boston & Albany $69. In 1882 and 1883 the expense per car was $28 on the Erie and $40 on the Lake Shore. In the Erie report for last year President King says :

"Many freight cars which had been destroyed, torn down or otherwise lost to the service, since the reorganization in 1878, were not replaced up to the present year, when this deficiency was supplied, in part, by the purchase of 400 new box cars and 400 new coal cars, of a capacity of 25 tons each, and at a cost of $347,810, which was charged to operating expenses. The deficiency remaining amounts to 5,614 tons in capacity, which is to be supplied by cars that are contracted for delivery during this autumn. When these are put into service the whole car equipment will be restored to its integrity."

The 25,614 tons of car capacity which, it appears, had actually disappeared down to the close of last year, was probably as much as 4 per cent. of the whole freight car capacity, and the expenditure last year on these neglected renewals was more than one-third of the whole expenditure for freight car repairs in 1883, and nearly half of the expenditure in 1884. Mr. King reports further, that for the five years to Sept. 30, 1885, the average number of cross-ties renewed had been but 666,049, while last year 1,276,786 were put in at a cost more than double that of the tie renewals the year before. Other depreciations of the property are mentioned by which expenses were reduced heretofore and increased last year. The progress made in restoring the property to a fully maintained condition is even more important than the increase in profits, for every year of neglect meant a large increase in the cost of the restoration when finally made and in other expenses meanwhile.

Besides the net earnings of the Erie proper, this company has the profit or loss on the leased New York, Pennsylvania & Ohio road, and of a great many subsidiary enterprises—the Jersey City ferry, the Pavonia Horse Railroad, docks, elevators, stockyards, etc. The New York, Pennsylvania & Ohio yielded a profit of $80,321 last year, against a loss of $239,820 in 1885, a loss of $270,281 in 1884, and a profit of $199,540 in 1883 (five months). The gross receipts from the other enterprises have been:

1881.	1882.	1883.	1884.	1885.	1886.
$844,300	$780,655	$876,799	$1,077,626	$1,002,692	$946,460

The expenses of these enterprises are not given in this report; in 1885 they were about $500,000; but last the final result of all the operations after paying interest, rentals and other charges was the minute surplus of $14,611.

Important information not contained in this report will appear in those of the Vice-Presidents.

THE ELEVATION OF CURVES.

The communication from Mr. Charles Latimer, under the above heading, in another column, again brings up a question which seems to be one for almost perennial discussion. Few men have given more attention to or have had larger experience in track matters of all kinds than Mr. Latimer, and his opinions are certainly entitled to great respect; yet after all, the manner in which the differences of opinion as to this question continually come to the surface—the mere fact that there are such differences of opinion, after 50 years of railroading—suggests that there must be some explanation other than either side admits for such conflicts of judgment.

For the natural tendency of all disputed questions is to settle themselves, if either side has much the best of it. When some men favored inside cylinders and others favored outside cylinders, and each put their views into practice, experience soon began to lead one side to believe they were wrong and the other side to be more sure they were right, and American practice became practically uniform within a few years. The contrast in results was too marked. So when the dispute began, years ago (and it was on many roads a very active one, strange as it now appears), as to whether or not it was better to "tear the engines all to pieces" by making them haul the last ton that they could, some roads took one side and some the other, but the net result was that those who hauled the heavy loads earned the heavy dividends, or came

nearest to it, and those who took the other side did not; and it is now some years since any one has had the hardihood to question that to haul the heavy loads pays the best in the end.

Even in minor questions, like that of laying track with broken or even joints, the same tendency for disputed questions to settle themselves is clear. The East and South have heretofore been almost solid for broken joints; the Northwest for even joints; but now, while the practice of the East and South remains the same the Northwest is quite rapidly swinging over to that of the remainder of the country. A number of very prominent roads in that region are now changing their former practice in this respect. The natural inference is that where frost is light or road-beds good, broken joints are the best, but where frost is heavy and road-beds bad there is a certain advantage in even joints. As the road-beds are improved, the practice is changed correspondingly.

Thus most disputed points of practice eventually cease to be disputed, but the question of the proper elevation to be given to the outer rail in curves, like the question of the exact formula for laying out switches, and some like questions, will not thus settle itself. Some continue to take one side, and some another, and neither will be convinced.

The most natural explanation for such persistency is, we believe, the true one; that it really makes very little difference, within considerable limits, whether the elevation be high or low, provided it be uniform and the track well put up. On what argument is the contrary claim based? On both sides, simply on this: that if the elevation is too high freight trains will be crowded down against the inside rail, and that if the elevation is too low passenger trains will be thrown out against the outside rail.

Now, neither of these positions is correct. Whether the elevation be much or little does not and cannot, as a matter of fact, alter the positions of the wheels in the slightest, unless the elevation be far in excess of the widest extremes of practice. The theory which leads to making so much of the question of elevation is that the latter is *the only* force which controls the position of the wheels, but what really controls the latter is a force vastly greater than any possible effect of super-elevation, viz., the tendency of the trucks to roll in a straight line. This constantly throws the truck up against the outside rail, to a position which brings the front flange against the rail and so compels the truck to curve. The flange pressure necessary to do this may be computed in a rough way at about one-fourth the weight on the wheels, from which it follows at once that the elevation, to be sufficient to throw the wheels away from the outside and against the inside rails, *must be about one-fourth the gauge*, or say 15 in.—a rather impracticable limit.

Until the elevation reaches this limit, all that can be accounted for mechanically as the effect of an excess of super-elevation is a certain relief of the *pressure* of the flange against the outside rail, not any change in its position. But this reduction of pressure, so far as it goes, should be an advantage. It does not by any means follow that it reduces curve resistance *pro rata*, but it certainly would appear that it must do so somewhat, and without any clearly visible contravening disadvantage. At least, if there be disadvantage, it is incumbent on those who claim that there is, to show what it is, and not assume it.

For example, assume a 6-degree curve elevated 6 in. The centrifugal force in such a curve at 10 miles an hour is $2.335 \times 6 = 14$ lbs. per ton, and proportionately to the square of the velocity, if higher or lower. The centripetal force from super-elevation is $\frac{1}{2\,0} \times 2{,}000 = 33.9$ lbs. per ton per inch of elevation, or 203.4 lbs. per ton. Consequently, at 10 miles per hour, there is an excess of force of about 190 lbs. per ton, pulling the trucks toward the inside rail, the super-elevation required by a velocity of 10 miles per hour on a 6-degree curve being less than half an inch instead of 6 in. But what of that? Actually to pull the wheels away from the outside rail requires a force large enough to slide the wheels laterally on the truck, or about 500 lbs. per ton, so that the only apparent "harm" done is to reduce the flange pressure in the proportion of 500 to 310 (500 — 190) which is surely not an evil.

On the other hand, assume the 6-degree curve to be elevated 3 in. and a passenger speed of 50 miles per hour. The centrifugal force is:

	Lbs. per ton.
$2.335 \times 6 \times 5^2 =$	350
The centripetal force of super-elevation, 33.9×3	102
Net excess of centrifugal force	248

Or, the flange pressure is increased from the normal 500 to 748 lbs., whereas, with 3 in. more super-elevation it would only be increased from 500 to 646 lbs.

Thus the higher super-elevation appears to be an advantage both to passenger trains and freight trains. We do not dogmatically assert this to be the fact, for there are or may be undertermined elements in the problem, and certainly it is only within reasonable and moderate limits that advantage can be hoped for from higher super-elevation, but the claims made in favor of low elevation rest wholly, so far as we know, upon the radically false assumption referred to, that the "cant" (as the English well and concisely term it) and the opposing centrifugal force are the only two forces which control the position of the wheels, neglecting the third and far greater force, which throws the wheels against the outer rail *at all speeds with a force equal to the centrifugal force due to a speed of* 146.34 *miles per hour on a* 1*-degree curve*, to a speed of 59.74 miles per hour on a 6-degree curve, to a speed of 46.28 miles per hour on a 10-degree curve, and to a speed of $\sqrt{\frac{500 \text{ lbs. per ton} = 2000 \times \text{coef. of friction}}{0.02335 \times \text{degree of curve}}}$ on any curve.

But this apparent great reduction of flange pressure from considerable super-elevation, if admitted to be true (as we think it must be), cannot possibly have any great effect on curve resistance, or practice would have long since settled itself in favor of high elevation. We can quickly see reasons why it should not have such effect. Most of the curve resistance comes from sliding on the top of the rail, with which flange pressure has nothing to do. For the remainder, it does not follow that because the flange is pressed more forcibly against the outer rail that it therefore causes appreciably more curve resistance. Unless and until the rail is badly flange-worn, or unless the rail is originally of bad shape, so as to permit the flange to come too quickly and too much into contact with the side of the rail, the side of the flange never rubs against the rail, but rides up cornerwise on the corner of the rail and the interior fillet of the flange, thus ⌒ until the *resultant* of the vertical force of gravity and the horizontal force of the flange pressure passes through the surfaces in contact. A little more or less flange pressure will alter the *direction* of this resultant and to some extent its magnitude or length, but not much, and hence we find in theory confirmation of what practice clearly indicates, that even considerably more or less speed, or considerably more or less "cant," with the consequent more or less flange pressure, need not in practice make enough difference in train resistance for the naked eye of the practical railroad man to detect.

We have tried to make this explanation so simple that every track-man could follow it, but if we have failed to do so he can console himself by remembering that the subject is not in its nature simple, but so obscure that he is in the excellent company of a long line of engineers who have been deceived in the matter. No one, to our knowledge, has ever detected and put on record the facts here noted, while technical literature is full of discussions resting on the false assumptions noted. It is past hoping for, therefore, that an explanation can be made simple enough to be absorbed like a daily paper editorial.

One further fact remains to be noted. Because the curve resistance is but little affected, it does not follow that difference of elevation does not considerably affect the danger of derailment in case of a bad rail or wheel, nor the smooth and comfortable riding of cars. On the score of safety against derailment, a tolerably high elevation is probably in all cases an advantage. The diagram above leaves no doubt of this, although on the other hand it must be noted that the danger is at the worst not great, on fairly good track.

On the score of smooth riding, which is an important one, there can be as little doubt that the ideal "cant" is that which exactly balances, or a shade more than balances, the centrifugal force. The disagreeable jerk in entering a curve comes primarily from the suddenness of the transition from a curve to a straight line, and can be remedied only by using "transition curves" to connect them; but its unpleasant effect is greatly intensified by the fact that both the body of the car on the car springs and the body of the passengers on the seat springs are thrown either to the outside or inside, if there be too much or too little super-elevation, with a resulting sense of insecurity and rough riding which is never pleasant, and which in extreme cases is very unpleasant, creating apprehension of danger when none really exists. As this is only important with passenger trains, it indicates, so far as it goes, that the elevation should be governed by the passenger speeds.

In this discussion we have not yet referred to the apparently contradictory fact mentioned by Mr. Latimer, that "a marked increase in hauling power of freight locomotives was noticed as soon as the curves were uniformly reduced to ½ in. per degree for standard gauge." We do not question the increase, but we must be permitted to question very seriously whether the alleged cause for the increase is the true one. An equally "marked increase in hauling capacity" has come about in some way or other on the Lake Shore road (and many others) without any reduction in elevation or curves, and in fact without any curves to reduce, worth mentioning. We have only to turn to its reports to find that the average Lake Shore train load has been in tons:

1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.
137.3	133.5	134.0	136.0	159.4	168.0	185.0	196.2
1878.	**1879.**	**1880.**	**1881.**	**1882.**	**1883.**	**1884.**	**1885.**
213.1	237.1	352.1	271.1	269.3	245.4	252.7	253.7

showing an increase in successive periods of 10 years of 114.8, 137.6, 135.3, 109.4, 93.3, 85.7.

This increase has been wholly accomplished by better character of road-bed, substitution of steel for iron rails, larger average car-loads, and greater care in loading engines to their full capacity, in the face of much "kicking" as to the engines being over-loaded. The engines have been throughout the same. The Atlantic & Great Western was certainly not conspicuous, when it went by that name, for loading its engines heavily, and a great improvement in the general character of the track of the Atlantic & Great Western was going on at the same time that the curve elevations were reduced. It is therefore unnecessary to assume any more doubtful explanations to be the true ones than those which are the only possible ones for the Lake Shore increase.

Export and Import Values in October.

The value of the merchandise exports from the United States last October was much greater than in any previous month of this year, but was less than in any corresponding month of any other year since 1880. The value of the exports was 15½ millions more in October than in September, which, however, is not unusual, the October exports having been the larger by 25⅛ millions last year, by 16½ in 1884, and by 18 millions in 1883. In every month after February and until October the value of the exports were larger this year than last.

The value of the imports in October was a little greater this year than last, and greater also than in 1884.

The values of the exports and imports in October for the last six years have been, in *thousands* of dollars:

	1881	1882	1883	1884	1885	1886
Exports	68,019	71,548	72,609	71,660	77,325	69,634
Imports	58,989	61,439	57,524	51,975	53,808	54,772
Excess of exp.	9,030	10,109	15,085	19,685	18,517	14,862

For the four months since June the exports have been a little greater than last year, but less than in any of the four years previous, while the imports have been a tenth larger than last year and the largest since 1882. They were, in *thousands* of dollars:

	1881.	1882.	1883.	1884.	1885.	1886.
Exports	261,058	251,696	241,391	235,705	210,188	227,684
Imports	228,856	256,372	224,259	209,123	204,033	224,436
Excess exp.	32,202	.....	17,132	26,582	6,155	3,248
Excess imp.	.....	4,676	.....	.....	.....	.....

The exports were 17½ millions (8 per cent.) and the imports 20½ millions (10 per cent.) more than last year, and the excess of exports over imports was less than in any other year. In 1880, the exports for these four months were 295 millions and the imports 221 millions, the exports being much greater than in any subsequent year and the imports slightly less than this year, and the excess of exports and imports no less than 74 millions, while the aggregate excess of exports in these four months for the last five years has been only 48½ millions.

For the first half of the year the exports and imports for *seven* years have been in *millions* of dollars:

	1880.	1881.	1882.	1883.	1884.	1885.	1886.
Exports	412.7	425.4	342.4	398.2	343.5	336.3	327.6
Imports	381.5	327.4	381.8	352.1	332.8	281.0	328.6

Thus, in the first half of this year the exports were *less* than in any of the six years previous, while in the four months following they were larger than last year. But while exports decreased imports increased largely in the first half of this year. In fact, the revival of imports may be said to have begun in Ociober of last year. In every previous month but one of 1885 the imports had been less than in the corresponding month of any other year since 1880. The average monthly decrease from 1884 had been 8.6 millions for the first six months of 1885; in July it was 6 millions, in August only a trifle, in September 1 million, and then the turn came with an increase of 1.8 millions in October, 5.4 in November, 10 in December, 5.2 in January, and 14⅛ in February. The comparisons are now with months after the turn had occurred, and in

view of the fact that the exports are not now increasing, it is well that the increase in imports in October was very small.

For the ten months ending with October, the exports and imports have been, in *millions* of dollars:

	1880.	1881.	1882.	1883.	1884.	1885.	1886.
Exports	707.8	686.4	594.0	639.6	579.2	546.5	555.3
Imports	602.3	556.2	438.2	576.4	541.9	485 1	553.0
Excess exp.	105.5	130.2	....	63.2	37.3	61.4	2.3
Excess imp.	....	....	44.2	....	....	....	..

There is thus a slight gain over last year in exports, but they remain decidedly smaller this year than in any other of the seven. The imports, on the other hand, are the largest for three years, 14 per cent. more than last year and nearly as much as in 1881. The excess of exports over imports is insignificant this year, the $2,300,000 contrasting sharply with the excess of $105,500,000 in 1880, and $130,200,000 in 1885, or even the $61,400,000 last year.

The excess of imports in 1882 was due to the great failure of all our leading crops in 1881 (cotton as well as wheat and corn), when the great number of railroads and other new enterprises under way compelled large imports in order to finish them. Our rail imports alone in that year cost something like $10,000,000, against less than a million this year.

All these figures indicate that the present activity in trade is not based on an increased demand for our products in Europe, such as stimulated business in 1879 and later, when our exports for the fiscal year to June 30 were, in *millions* of dollars:

1872	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.
476.4	575.2	633.3	559.2	594.9	633.0	695.7	699 5	823.9	883.9

In the two years from 1878–79 to 1880–81 (ending June 30) the exports increased 184 millions, or 26 per cent.; in the two years from 1883–84 to 1885–86 (ending Oct. 31) the exports have *decreased* 38 millions, or 5 per cent. The decrease in the last two years is not considerable, but the fact that exports show no signs of increasing is an important one.

The apparent final determination to proceed with the construction of an overhead entrance for the Pennsylvania Railroad in to Jersey City, as announced last week, is an item of no common significance. It is one of the first of what will eventually become, beyond doubt, a vast class of works in this country, as it has been in England, viz., structures designed primarily to facilitate quick and safe transit through crowded centres of population. There are indeed the great works by which various lines are carried into the heart of New York, Philadelphia and St. Louis, but these have for their primary purpose to bring or keep the terminal stations nearer to the centres of population. There are also a few such works as the Baltimore tunnel, designed to carry lines through cities where it would otherwise be impossible or very difficult to construct the line at all; and there are one or two such works as that of the New York Central at Rochester, where the combined desire to get out of the way of the streets and to save heavy grades was the inducement for construction.

But the Jersey City improvement differs from all of these. It makes the grades rather worse than better; it gives the road no advantage of locality which it has not heretofore enjoyed, nor does it save it any such advantage which it was in danger of losing. It is simply a recognition of the fact that the growing population and wealth of the country demand both speed and safety, and that the railroads likewise can afford to have it and cannot afford any longer to do without it. As such it is a significant step in advance, and the precursor, beyond doubt, of great numbers of similar works which the next two or three decades will see constructed, and at many cities, as for instance Chicago, the time has probably already come when far more extensive works than this are demanded and justifiable.

It is said that the cost of the improvement will be about $900,000, and if the vital statistics of Hudson County are correct, had it been in existitence, it would have saved, since 1877, 454 lives; which have been lost within the short stretch of half a mile. In the present calendar year 60 lives have already been lost on this stretch, a rate of slaughter which indicates that humanity alone demanded the prompt construction of the works, since the cost of the improvement, at 4 per cent., will only be $36,000 per year, against which is to be recharged, probably, at least half that sum as the cost of maintaining flagmen, damages and other indirect expenses. In fact it seems quite possible that the whole interest charge may have been eaten up annually. But at $18,000 per year the saving by keeping the track at grade amounts to less than $300 per life annually lost—a pitifully small sum when one looks at it in that way, and one which is probably quite as large as would be found to exist at many other localities if the inertia of custom were overcome enough to look into the matter as fully and promptly as humanity and economy alike demand. The effect upon passenger traffic of such improvements is alone extremely important, and in the above we have not considered it at all.

The Late Leander Garey.

As announced in another column, Mr. Leander Garey, General Superintendent of the Car Department of the New York Central & Hudson River Railroad from 1871 to 1885, and for at least ten years before that connected with the Harlem Railroad in a similar capacity, died at his home in Hartsdale, Westchester County, N. Y., Nov. 24, or just before Thanksgiving. His last wish, that he might live over that festival, was not gratified, but his end was such as became his life, quiet and peaceful, and surrounded by his family, and his last words were, "God bless you all." He died of typhoid malarial fever, brought on by a cold contracted in the service of an Agricultural Society of which he was Vice-President.

Mr. Garey was a fine representative of that class which is fortunately so large in this country, those who are not heard of much by the general public during life, but who live with a single eye to being faithful and successful in the discharge of the duties intrusted to them. Perhaps the work for which he will be longest remembered by the railroad world at large was the leading part which he took in organizing what has since become so important and useful a body, the Master Car-Builders' Association. In July, 1864, a dozen or more men met at West Albany, among whom was Mr. Garey, and in fact, although not in form, laid the foundations of the organization. Two more meetings were held in 1864 and 1865, and at a fourth meeting, in 1866, the first beginning of what have since become the interchange rules was adopted. Other meetings, still of an informal kind, were held at West Albany, N. Y., and Adrian, Mich., and finally, in 1867, at Altoona, Pa., the first formal convention of the Master Car-Builders' Association was held. At all these meetings Mr. Garey took an active part, and in 1870 he was elected Secretary. In 1874 he was elected President, and he held that position for ten successive re-elections, until he retired from active railroad service, a year before his death.

Mr. Garey was born at Dover, Me., Aug. 27, 1827, and was, consequently, in his sixtieth year at the time of his death. His first fixed income after he learned his trade, as he was fond of relating, was $1 per day, to earn which he walked three miles daily back and forth from his work, with his lunch under his arm. The first entire suit of clothes which he ever purchased with his own money, and took more satisfaction in, perhaps, than any he ever bought later, cost him $5—facts which vividly bring to mind how far back into a simpler past a life of even 60 years now carries us. Where he learned his trade we do not now recall, but for full 30 years, or for all his really active manhood, he was connected with the Vanderbilt roads in responsible executive positions, and was the trusted mechanical adviser of the late Commodore and Wm. H. Vanderbilt, with both of whom his relations were of a quite intimate and personal nature. In fact, it is related that when the late Wm. H. Vanderbilt first began his experience in railroad management it was chiefly through Mr. Garey that he learned, in a somewhat amusing way, that requisitions were made out to be filled, and not to be cut down.

What Mr. Vanderbilt thought of Mr. Garey's character and capacity is best shown by the following letter, now first published:

"*The New York Central & Hudson River Co., Office of the President, Grand Central Depot,* NEW YORK, Oct. 20, 1873.

"*Mr. Leander Garey:*

"DEAR SIR: You are appointed Superintendent of the Car Shops of the New York Central & Hudson River Railroad Co. and its divisions, the appointment to take effect from this date.

"It is not necessary that I should express to you in detail, in this communication, the duties devolving upon you by this appointment; it is sufficient for the purpose, that I state that my confidence in your ability, integrity and efficiency, has induced me to place in your charge the general supervision, control and direction of all new construction, general repairs and expenses, including the estimates and requisitions for purchase of all materials relating to construction and repairs, at the car shops of this company.

"Your designation to this position, is a step long contemplated towards the organization of the car shops into a department, with one person at the head of it, having general powers, and from whose experience and intelligence I can hope to receive all needed information for my consideration and action.

"The immediate result of your appointment, it is expected will be the introduction of order and economy in the shops, and the institution of a system of direct reference to you for authority for any and every expense to be incurred.

"For the accomplishment of the beneficial results anticipated by me, ample power is given to you.

"The position is one of trial and trust, requiring experience, fidelity, discretion and energy to insure success. In the discharge of its duties you will always have my official and personal encouragement. Your relation to the heads of other departments will be advisory, and it will be your duty, as I believe it will be your pleasure, to co-operate with them as far as possible, in protecting and promoting the interests of the company.

"I remain, dear sir, very truly yours,

"W. H. VANDERBILT, Vice-President."

Another distinction of Mr. Garey was that he was almost the first to build the modern type of street car. Up to a few years ago he built all the cars used on the Fourth avenue line, and some of his very earliest cars, which were at the time striking novelties, are still in service. The Fourth avenue road has always had credit for running excellent cars, a fact which reconciled many to the higher fare which was charged for many years. In these, as in ordinary railroad cars, Mr. Garey introduced from time to time many improvements of a patentable nature, yet he never took out a patent. Another peculiarity of his, in which he rather prided himself, was that he would never give any letters of recommendation for general publication.

Mr. Garey was simple almost to abstemiousness in his personal habits, and his temperament was modest, retiring and thoroughly kindly. Few men have succeeded better in winning and keeping the affectionate regard of those placed under them. It is related by one who labored at his elbow for a score of years that, although a man of great firmness and quick decision in handling the great workshops under his charge, he was never heard to utter a harsh word. His character and his active labors in the advancement of mechanical interests won him friends in all parts of this country, who will learn with regret of his death. He leaves, provided with a modest competency, a wife and four children, two of the latter being very ill at the time of his death.

The Late William Woodcock.

For the second time in two years the Master Mechanics' Association is called upon to mourn the loss of its head. Mr. William Woodcock, President of the Association, died at his home in Elizabethport, N. J., at noon on Saturday, Nov. 27, last. His death will be especially a shock to those who met him at the convention in Boston last June, when he was a strong and active man, in the prime of life, with apparently many years of usefulness before him. Mr. Woodcock was sick only some ten days, and his death, we understand, was due to typhoid pneumonia.

He was born in England in 1834 and came to this country with his parents when still a child, and settled in Pennsylvania. He learned the machinist's trade at a shop in Parkesburg, Chester County, Pa., and soon after serving his time became foreman of a shop in Harrisburg. Later he entered the service of the Delaware, Lackawanna & Western Railroad, and was for several years Foreman of that company's repair shop in Scranton. From Scranton he went to Philadelphia, and was appointed Superintendent of the Philadelphia & Reading Railroad repair shops at Ninth and Green streets in Philadelphia. His faithfulness and intelligence in subordinate positions did not fail to attract attention, and in 1870 he was offered the position of Master Mechanic of the Central Railroad of New Jersey, which he accepted and held until his death.

Mr. Woodcock early joined the Master Mechanics' Association, and was one of its most valuable members, doing well more than his share of committee work, and speaking, not frequently, but well and to the point, in the conventions. He earned the respect of the members, and his kindly and genial disposition made him popular. He was chosen Second Vice-President in 1884, First Vice-President in 1885, and last June succeeded to the Presidency.

He was highly esteemed, not only by his professional associates, but by his neighbors and associates in daily life. He was a man of quiet, unassuming manners, and yet public spirited, taking an active interest in the welfare of the city of Elizabeth, where he resided since 1870. He was also a man of great benevolence, doing much for charity that escaped publicity and was never heard of except through the beneficiaries. He was also connected with benevolent institutions, being a director of the Elizabeth General Hospital and Dispensary, and a trustee of Evergreen Cemetery. His popularity was shown by his election to the Elizabeth Board of Education from a ward which usually gives a heavy majority for the party to which he was opposed. He was also an active member of the City Board of Health. He was for years an active member of the Presbyterian Church, and an elder in the local organization. He was also a Mason and Knight Templar in good standing.

Mr. Woodcock's wife died several years ago, and the only member of his immediate family was a niece who had lived with him from early childhood, and whom he had brought up as a daughter.

While a strict, upright and faithful officer of the company which he served, he was also very popular among the men under his charge, many of whom mourn him as a personal friend who had their welfare at heart.

The cause of Mr. Woodcock's success in life and popularity may be summed up in a few words: He was a thoroughly reliable man. As such he quickly impressed those with whom he had dealings, and the impression was only deepened upon a closer acquaintance.

The Late Walton W. Evans.

Mr. Walton W. Evans, whose death in his seventieth year is announced in another column, was one of the most notable and successful of American engineers. He was with one exception the oldest living graduate of the Troy Polytechnic Institute, and very early in his professional career went to Chili, where he speedily laid the foundation of his fortunes and his professional fame. The part which he took in the introduction of railroads and other engineering works in all parts of South America was very great, and to the stimulus of his energy and ability was due not a little of the creditable progress which Chili and other South American countries have made in the last two or three decades.

For these services Mr. Evans reaped a more than usually ample reward. He was early appointed the agent of numerous South American and other foreign enterprises in this city, including the famous Meiggs enterprises, placing contracts for nearly all their rolling stock and supplies in both this country and England and likewise engaging their engineering staff. These numerous contracts (aggregating, it is said, some $20,000,000) were not placed under orders in the usual form, but both the quantity and quality of the goods and plant ordered were left largely, and the most part wholly, to his discretion.

Such authority could only have been given to a man who

enjoyed a deserved reputation for absolute integrity, and his intense interest in all technical questions, and the ready way in which he would drop everything else to devote much time and labor to presenting his views on them, is not the least of the evidences that his first thought, and his last one likewise, was for the interest of his clients. There is nothing so remarkable in such fidelity as to make it worth special comment in any ordinary case, but perhaps no man in this country or abroad has had more absolute and unchecked discretion vested in him for the disbursement of many millions from the pockets of men on the other side of the globe.

Mr. Evans was one of the earliest friends of the *Railroad Gazette*, and was a frequently contributor to these columns, as to the *Transactions* of American Society and Institution of Civil Engineers (of both of which organizations he was a member), and to many other technical journals throughout the world. He was an earnest believer in and champion of American ideas in railroad construction and equipment, and his trenchant pen did not a little to extend their fame and use, not only in South America, but in Mexico, Australia and New Zealand, in all of which countries he was professionally engaged. He was not blind to merit elsewhere, however, and almost his last literary work was a careful and appreciative paper on the Abt system of operating inclines, written in his sixty-ninth year, which gave one of the best summaries of all that has been done in that line which has appeared. Within a few days of his death he prepared a careful preface to the republication in book form of Mr. Edward Bates Dorsey's paper on "English and American Railroads Compared." He was at all times an indefatigable worker.

His death removes a unique figure from the profession of engineering. From the magnitude of the works executed by him and the importance of the interests intrusted to him he was certainly entitled to high rank in the list of living engineers, and his kindly cordiality towards hundreds of younger men whom he has at various times assisted, and his unassuming and human interest in their welfare, will add with many a feeling of personal sorrow to the regret with which the death of so able and indefatigable a man must everywhere be noted.

Pennsylvania Railroad Earnings in October.

The most notable fact in the Pennsylvania statement for October, as in those for August and September, is the very large increase in the working expenses. For the first six months of this year the expenses were but $780,800 (5¼ per cent.) more than last year; but for the four months following they were $1,551,228 (16 per cent.) more than last year. The expenses were larger by the average amount of $130,134 per month in the first period, and of $387,807 per month in the last period, which is certainly a great change. The increase in gross earnings was $322,000 per month in the first six months, and $519,000 per month in the last four; but the increase in net earnings was $191,500 per month (18 per cent.) in the first six months and only $121,000 (8 per cent.) in the last four. Thus the expenses have increased more in proportion than the earnings of recent months. Through rates are so much higher than last year, and much local business in so much better condition to pay higher rates, that we should not expect the working expenses to be a larger proportion of the earnings, as they have been for the last four months (61 per cent. this year against 59¼ last).

The gross and net earnings and working expenses of the Pennsylvania's lines east of Pittsburgh and Erie in October, for the last 14 years, have been :

Year.	Gross earnings.	Expenses.	Net earnings.
1873	$3,757,311	$2,132,285	$1,625,026
1874	3,482,587	2,040,548	1,442,039
1875	3,272,267	1,829,433	1,442,834
1876	4,004,429	1,821,278	2,183,151
1877	3,210,038	1,704,764	1,505,274
1878	3,215,418	1,655,871	1,559 547
1879	3,518,144	1,832,214	1,685,930
1880	3,882 715	2,194,321	1,688 394
1881	3,672,971	2,317,930	1,355,032
1882	4,660,053	2,622,341	2,037,712
1883	4,875,345	2,659,197	2,216,148
1884	4,447,544	2,524.844	1,922.700
1885	4,359.171	2,423.360	1,935.811
1886	4,737,348	2,877,602	1,859,746

Thus the gross earnings this year were exceeded only in 1883, the expenses were much larger than ever before, and the net earnings were the smallest for five years.

Compared with last year, there is—

An increase of ..... $378,177, or 8⅝ p. c. in gross earnings.
An increase of ..... 454,242, or 19 p. c. in expenses.
A decrease of ..... 76,065, or 4 p. c. in net earnings.

It will be noticed that the expenses last year were considerably less than for three years previous, and they doubtless were below the average requirements. The gain in gross earnings is large, and is a gain over a month of good business last year.

The lines west of Pittsburgh and Erie make a more favorable showing so far as the net financial result is concerned: For eight years these western lines have yielded in October a surplus over liabilities amounting to :

1879	$593,182	1883	$268,893
1880	418,170	1884	142,833
1881	309,894	1885	127,926
1882	513,209	1886	256,842

The surplus this year, though less than in any of the five years from 1879 to 1883, is twice as great as last year and 80 per cent. more than in 1884, and the gain here is more than three times as great as the loss on the eastern system. Adding the surplus of the western system to the net earnings of the eastern system, we have :

1879	$2,270.112	1883	$2,485,041
1880	2,106,564	1884	2,065.333
1881	1,664,926	1885	2,062,737
1882	2,550,921	1886	2,116,588

Thus the profit from the two systems is this year slightly greater than for the two years next previous, but a great deal less than in 1883, 1882 and 1879.

For the 10 months ending with October the gross and net earnings and working expenses of the lines *east* of Pittsburgh and Erie have been :

Year.	Gross earnings.	Expenses.	Net earnings.
1876	$30,343,263	$18,716,426	$11,626 337
1877	25,216,296	15,793.302	9,422.994
1878	26.035.337	15.189.777	10,854.560
1879	28,034,356	16.665,316	11,379,040
1880	34,157 327	20,022,•30	14,114,697
1881	36,552,212	21,801.374	14,750,838
1882	40.548,834	24.903.620	15,645,214
1883	42,769,257	26,473.559	16,295,698
1884	40,846,647	25.378,085	15,467,962
1885	37,596,806	24,437,022	13,159,784
1886	41,603,635	26,769,054	14,834,581

Thus the gross earnings this year were exceeded only in 1883, the working expenses were never exceeded, though they were almost equalled in 1883, and the net earnings were exceeded in 1882, 1883 and 1884, and were nearly equalled in 1881.

Compared with last year the increases are :

In gross earnings ..... $4.006.829, or 10 6 per cent
In expenses ..... 2,332,032, or 9.5 " "
In net earnings ..... 1,674,797, or 12.7 " "

This quick recovery from the very unfavorable results of last year is remarkable, but besides the restoration of through rates, a great increase in activity in the great industries on this system have helped to bring it about. The increase of one-eighth in net earnings is a very great gain, though not as much by $663,000 as the decrease from 1884 to 1885.

Meanwhile the surplus over all liabilities, or the deficit in meeting them, of the lines *west* of Pittsburgh and Erie have been for the ten months :

1879	Surplus, $702,018	1883	Surplus, $1,163,211
1880	" 2,514.735	1884	Deficit, 519 026
1881	" 2,578,677	1885	" 1,116,559
1882	" 1,580,981	1886	" 4,941

This is a gain of $1,111,000 over last year, and of $514,000 over 1884, but a large decrease from previous years.

Adding the surplus of this system to and subtracting its deficit from the net earnings of the system east of Pittsburgh and Erie we have as the income from both systems :

1879	$12,081,058	1883	$17,458,909
1880	16,629,432	1884	14,948,936
1881	17,329.515	1885	12,043,225
1882	17,226,195	1886	14,829,640

Thus the income this year is $2,786,415, or 23 per cent. more than last year, which is but little less than 3 per cent. on the stock outstanding. It is, however, slightly less than in 1884, and from $1,800,000 to $2,630,000 less than in any of the four years from 1880 to 1883.

November was hardly to be called a favorable month for this company last year, while gross and net earnings were unusually large in December. The condition of things favors a large increase in gross earnings in these two months this year and a considerable increase in net. Altogether it seems reasonable to expect the net earnings of the eastern system to be at least as large this year in 1884, and perhaps $2,100,000 more than last year, and a gain of about $1,300,000 on the western system. For the entire year this would make the profit from both systems $18,453,000, while for six years previous to 1885 it had been :

1879.	1880.	1881.	1882.	1883.	1884.
$15,861,000	$19,707,000	$20,062,000	$20,220,000	$20,149,000	$17,178,000

Thus the estimate for this year leaves them considerably less than in any of the four years from 1880 to 1883, during which they varied very little, though the net earnings of the eastern system and the surplus of the western system, of which these profits are composed, varied a great deal.

Erie Earnings and Expenses in October.

For October, the first month of its fiscal year, the Erie, like the Pennsylvania, shows a large increase in gross earnings, but, unlike the Pennsylvania, also a considerable increase in net earnings. For the ten years since its reorganization, the earnings and expenses of the Erie proper in October have been:

Year.	Gross earn.	Expenses.	Net earn.
1877	$1,535,343	$930,790	$604,553
1878	1,473,532	854.045	619,487
1879	1,713,697	997.975	715,722
1880	1,899,910	1,013,406	886.504
1881	1,814,866	1,189,188	625,678
1882	1,819,010	1,175,681	643,329
1883	1,983,468	1,196,245	787,123
1884	1,511,159	932.497	578,662
1885	1,623,737	951.102	672,635
1886	1,851,020	1,101,811	749,209

Thus the gross and the net earnings this year were exceeded only in 1880 and 1883, the working expenses having been exceeded only in 1881, 1882 and 1883. Compared with last year the increases are :

In gross earnings ..... $227.283, or 12.3 per cent.
In expenses ..... 150,709, or 15.8 "
In net earnings ..... 76,574, or 11.4 "

Compared with 1884, when the fortunes of this road were at the lowest, there is an increase of 22½ per cent. in gross and 29½ per cent. in net earnings.

Meanwhile the earnings, expenses, rentals and profits over rental of the leased New York, Pennsylvania & Ohio Railroad in October since the lease have been :

	1883.	1884.	1885.	1886.
Gross earnings	$628,939	$524,556	$524,869	$564,470
Expenses	371,434	307,517	355,136	355.235
Net earnings	$257,505	$217,039	$169.733	$209,235
Rental	201,260	167,858	167,958	180,630
Profit	$56,245	$49,181	$1,775	$28.605

The increase in gross earnings on this road is much less than on the Erie proper, being only 7 per cent.; but as there was no increase in working expenses the gain in net earnings was no less than 23 per cent. Adding the profit of the leased road to the net earnings of the Erie proper, we have as the company's income from both roads in October :

1883.	1884.	1885.	1886.
$843,368	$627,843	$674,410	$777,814

which sums are to be compared with the net earnings of the Erie proper in years previous to 1883. The gain over last year is $103,804, which is equal to more than half of the interest on the second consolidated bonds accruing in the month.

In the description of the portable rail saw built by the Industrial Works, of Bay City, Mich., for the Michigan Central Railroad, in our issue of Nov. 19, the credit which should justly be given to Mr. W. L. Clements, Mechanical Engineer of the works, for the design of this excellent piece of mechanism, was by accident omitted. The completed device was the result of nearly a year's study and work on his part, a fact which, perhaps from over-modesty, he had neglected to add to the notes from which our description was prepared.

By a typographical error, the greatest depth of water at the new St. Lawrence River bridge at Lachine was given as 90 ft. instead of 40 ft., as it should be. The method of obtaining foundations, as described, would, of course, be practically out of the question in so great a depth of water as 90 ft.

Mr. John N. Abbott, who gives up the position of General Passenger Agent of the Erie, which he has held 14 years, to become Commissioner of the Southwestern Passenger Association, with office at Chicago, is exceptionally familiar with the methods of conducting a competitive passenger business, and the circumstances which enable a line to command a large or small share of it. The Erie for many years was so much inferior to its rivals in certain important particulars, that it was only by great attention to what are usually considered minor points, and unremitting and energetic efforts, that it could secure a large share of the travel. But under Mr. Abbott it succeeded almost always in getting a very large share, and in increasing its reputation among travelers.

On another page we print a letter giving some particulars of a long run made by the "Charles Dickens," a passenger locomotive on the London & Northwestern Railway, England. When at Crewe a few weeks ago, Mr. Webb kindly showed the writer the engine, then in the paint shop. The engine was going out with her third crank axle, the others, after having each run about 250,000 miles, being removed to go under goods or freight engines. A few new pins were placed in the motion, but with these exceptions little was done to the motion work. The cylinders were bored out ⅝ in. larger diameter than their original size, the wear thus being ⅛ in. per 100,000 miles. The engine is inside connected, 17 × 24 in. cylinders, straight or Allan link motion, four coupled drivers 78 in. diameter, and a single pair of leading wheels 42 in diameter, having some side play.

A large number of similar engines are at work on the London & Northwestern, and their moderate weight, about 78,000 lbs., and their good steaming, running and wearing qualities render them great favorites with the drivers. The trains on which the mileage was accomplished run the 188¾ miles between Manchester and London in 4¼ hours, a speed of 44.4 miles per hour, including stops, which is good work. The gradients are good, rarely exceeding 30 ft. to the mile.

The dawn of a better day as respects rail practice is indicated by the fact that the Bethlehem mills are just completing an order of between 1,500 and 2,000 tons of rails of *ninety pounds per yard* section for the Philadelphia & Reading. To that complexion we must come at last on lines of heavy traffic, and the sooner it is done the better it will be for the stockholders, provided always proper care be taken to get good quality, without doing which mere weight of section will be of little advantage.

The reduction of fares to five cents at all hours on all lines of the New York elevated railroads seems to have resulted more favorably than the most sanguine had hoped. During November the number of passengers carried and the earnings this year and last were :

	1886.	1885.	Increase.	P. c.
No. passengers	13,214.573	8,955,976	4,258,597	47.5
Earnings	$667,482	$590,893	$76,589	13.0

The fare last year was 5 cents for five hours each week day and all Sunday, and 10 cents in the other hours. This year it was 5 cents at all times. As the average fare received last year was only 6.6 cents, it is evident that the 10-cent passengers must have been a small proportion of the whole. Now the cars are so much crowded between 7½ a. m. and 4½ p. m., as well as at the old commission hours, that traveling is much of the time very uncomfortable.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

Carolina Central.—Extended westward to Rutherfordton, N. C., 6 miles.

Duluth & Iron Range.—Extended from Two Harbors, Minn., southwest to Duluth, 29½ miles.

Georgia Midland & Gulf.—Extended northeast to Ellerslie, Ga., 5 miles.

Gulf & Ship Island.—Extended from Ripley, Miss., south to Cotton Plant, 10½ miles.

Lime Rock.—Completed from Camden, Me., to Simonton Corner, 2½ miles.

Minneapolis, Sault Ste. Marie & Atlantic.—Extended from Bradley, Wis., east by north to Rhinelander, 18 miles.

Missouri Pacific.—The *Council Grove, Osage City & Ottawa Branch* is extended west to Council Grove, Kan., 6 miles. The *Topeka, Salina & Western* is extended to Ness City, Kan., 9 miles.

Monocacy Valley.—Completed from Mechanicstown, Md., to Catoctin Iron Works, 3½ miles.

Montgomery & Florida.—Track laid from Montgomery, Fla., south 13 miles.

St. Paul, Minneapolis & Manitoba.—A branch is completed from Elk River, Minn., north to Milaca, 33 miles.

Talladega & Coosa Valley.—Extended from Youngs, Ala., west to Stanley, 4 miles.

This is a total of 140 miles on 11 lines, making 6,111 miles reported so far this year. The new track reported to the corresponding date for 15 years has been :

	Miles.		Miles.		Miles.
1886	6,111	1881	7,353	1876	2,177
1885	2,593	1880	5,694	1875	1,237
1884	3,509	1879	3,445	1874	1,767
1883	5,819	1878	2,207	1873	3,507
1882	9,574	1877	1,977	1872	6,885

This statement covers *main track only*, second or other additional tracks and sidings not being counted. The new mileage reported now exceeds 6,000 miles, and is greater than that for any of the previous years, except 1882, 1881 and 1872.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows :

Boston & Albany, annual meeting, at the Meionaon in Boston, at 11 a. m. on Dec. 8.

Boston & Maine, annual meeting, at the City Hall in Lawrence, Mass., at 10.30 a. m. on Dec. 8.

Housatonic, annual meeting, at the office in Bridgeport, Conn., Dec. 17.

Illinois Central, special meeting, at the office in Chicago, at 11 a. m. on Jan. 18, to vote on a proposed increase of capital stock.

Lehigh & Hudson River, annual meeting, at the office in New York, Dec. 6.

New York, New Haven & Hartford, annual meeting, in New Haven, Conn., Dec. 15.

New York & New England, annual meeting, at the office in Boston, Dec. 14.

New York, Providence & Boston, annual meeting, at the office in Providence, R. I., Dec. 8.

Peoria, Decatur & Evansville, special meeting, in Peoria, Ill., Dec. 20.

Richmond & Danville, annual meeting, at the office in Richmond, Va., Dec. 8, at noon. Transfer-books close Nov. 8.

Richmond & West Point Terminal Co., annual meeting, in Richmond, Va., at noon on Dec. 7.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows :

Chicago & Northwestern, 1¾ per cent., quarterly, on the preferred stock, and 3 per cent., semi-annual, on the common stock, both payable Dec 28, to stockholders of record on Dec. 7.

Delaware & Hudson Canal Co., 1¼ per cent., quarterly, payable Dec. 15, to stockholders of record on Nov. 27.

Old Colony, 3½ per cent., semi-annual, payable Jan. 1, to stockholders of record on Nov. 30.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows :

The *Master Car-Builders' Club* holds its regular meetings at the rooms, No. 113 Liberty street, New York, on the third Thursday in each month.

The *New England Railroad Club* holds its regular meetings at its rooms in the Boston & Albany passenger station in Boston, on the second Wednesday of each month.

The *Western Railway Club* holds its regular meetings at its rooms in Chicago on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

Foreclosure Sales.

The *Little Rock, Mississippi River & Texas* road will be sold in Little Rock, Ark., Dec. 15, under the decrees of foreclosure granted by the United States Circuit Court. The sale will include both lines of the road; one extending from Little Rock to Arkansas City, 113 miles, and the other from Trippe, 7 miles from Arkansas City, west to Warren, 49 miles. The purchaser will be required to pay $25,000 at the time of sale, and such further amounts as the court may direct, the balance to be payable either in cash or in overdue bonds and coupons.

The *Cincinnati & Eastern* road will be re-sold in Cincinnati, Jan. 5, Mr. Netter, the purchaser at the former sale, having failed to comply with the terms of his bid. The order of the court requiring a new sale specifies that no bid less than $750,000 will be accepted, and that the purchaser shall make a deposit of $200,000 at the time of the sale.

Baltimore & Ohio Employes' Relief Association.

The October sheet of this Association notes payments made to members for the month as follows:

	Number.	Amount.
Accidental deaths	3	$3,000
Accidental injuries	269	3,498
Natural deaths	14	3,900
Natural sickness	544	8,781
Physicians' bills	98	430
Total	918	$19,609

The departments to which payments (excluding physicians' bills) were made, were: Main Stem, Transportation Department, 193; Machinery Department, 222; Road Department, 102; Philadelphia Division, 17; Trans-Ohio divisions, 197; Pittsburgh Division, 89; total, 820.

Master Car-Builders' Club.

The following circular has been issued by the Committee, dated New York, Nov. 26 :

"The need of a Railroad Exchange in this city, where those interested in railroad affairs could meet for social and business intercourse, has long been felt, and while the Master Car-Builders' Club has, to a certain extent, supplied the want, the location of the rooms has been a matter of much complaint among the patrons and supporters of those rooms, as well as a serious drawback to the growth and prosperity of the Club.

"Recognizing this, the Committee believe that a reorganization of the Club under a more comprehensive name, enlarging its scope and work, and securing better accommodations in the matter of rooms more centrally located, would result in renewed interest being manifested in the Club, and at the same time be of much service to railroad officials and others. It is therefore proposed :

"1. To reorganize the Club under the name of 'The New York Railroad Club,' having a set of officers and an executive committee.

"2. To secure suitable rooms in a central part of the city, convenient to, or within easy distance of, all prominent hotels and depots.

"3. To have the rooms in charge of a janitor who will be in attendance early and late, caring for baggage and providing for the comfort of those making the rooms their headquarters.

"4. To hold meetings from time to time, at which live railroad topics will be discussed.

"The desirability of, and advantages arising from, such an agency will be apparent to all. Especially will it commend itself to those who have occasion to make flying visits to the metropolis for a day, and do not register at a hotel.

"A meeting to consider this plan will be held at the Master Car-Builders' Club rooms, 113 Liberty street, New York city, Tuesday, Dec. 7, 1886, at 8 p. m., and all who are sufficiently interested in the matter are cordially invited to be either *present* or *represented*."

Brotherhood of Railway Section Foremen.

Delegates from the railroad section foremen of North America met in Council Bluffs, Ia., Nov. 26, and organized the "Brotherhood of the Railway Section Foremen," which is intended to include all the section foremen between the Atlantic and the Pacific. The object is mutual benefit and "to bring more proficiency into the track department for the better protection of the traveling community at large and the safety of employés in the operating departments." Officers were elected, the organization completed and arrangements made for its extension.

American Society of Mechanical Engineers.

The annual meeting of this Society is in progress in New York this week. Business meetings were held on Monday evening and on Tuesday, at which a number of papers were presented, officers elected and the usual routine business transacted. On Wednesday the members went to Newark, N. J., to visit industrial works there, and on Thursday there was a meeting and a reception at the Stevens Institute in Hoboken.

ELECTIONS AND APPOINTMENTS.

American Society of Mechanical Engineers.—At the annual meeting in New York this week the following officers were chosen for the ensuing year: President, George H. Babcock, New York; Vice-Presidents, Joseph Morgan, Jr., Johnstown, Pa.; Charles T. Porter, New York, and Horace S. Smith, Joliet, Ill.; Managers, Frederick G. Coggin, Lake Linden, Mich.; John T. Hawkins, Taunton, Mass., and Thomas R. Morgan, Sr., Alliance, O.; Treasurer, William H. Wiley, New York.

Atlantic & Pacific.—Mr. F. E. Nelson, having resigned, Mr. R. A. Mathews is appointed Superintendent Road Department, with headquarters at Albuquerque, N. M. Appointment in effect Nov. 19.

Mr. J. J. Blower having resigned, Mr. L. H. Northup is appointed Acting Local Auditor. Appointment in effect Nov. 20.

Birmingham, Lagrange & Macon.—The office is in Birmingham, Ala. The incorporators are B. H. Bigham, William C. Yancey, Robert S. McFarlin, E. D. Pitman, John F. Milner and others.

Boston & Albany.—Mr. Henry T. Gallup has been appointed General Superintendent in place of Mr. Edward Gallup, who goes to the Lake Shore & Michigan Southern road. Mr. Henry B. Chapin succeeds Mr. H. T. Gallup as General Freight Agent. Mr. Chapin has been Assistant General Freight Agent for some time.

Brotherhood of Railroad Section Foremen.—The officers of this new society are: M. McInteer, First Grand Chief Foreman, Mount Auburn, Ia.; D. Coughlin, Vice Grand Chief, Stansberry, Mo.; M. Scanlan, Grand Secretary and Treasurer, Council Bluffs, Ia.; S. A. Oren, Secretary and Treasurer of the Insurance Branch, Mount Auburn, Ia. The Grand Secretary's office is to be situated in Council Bluffs, Iowa.

Buffalo, Rochester & Pittsburg.—At the annual meeting in New York, Nov. 24, the following directors were elected : Adrian Iselin, Walston H. Brown, Frederick A. Brown, A. Iselin, Jr., Alfred Roosevelt, George W. Parsons, F. D. Tappen, Henry I. Barbey, Auguste Richard, John G. Neeser, John H. Hobart, Wheeler H. Peckham, and A. H. Stevens. The only changes are the substitution of Henry I. Barbey for F. O. French.

Cairo, Vincennes & Chicago.—The following from Anthony J. Thomas, Managing Receiver, is dated Cairo, Ill., Nov. 29 : "Mr. Samuel P. Wheeler, having tendered his resignation as General Manager, on Sept. 20 last, and having remained, at my request, until this time, his resignation has been accepted, to take effect Dec. 1, and he will, on retiring, assume the position of General Solicitor for the Receivers. Mr. M. A. McDonald has been appointed General Manager, *vice* Mr. Wheeler, resigned."

Central Iowa.—Mr. Ethelbert L. Dudley has been appointed Receiver in a suit brought to foreclose the mortgage on the Illinois Division.

Central, of New Jersey.—Mr. Thomas B. Russam has been appointed Acting Master Mechanic in place of Wm. Woodcock, deceased.

Chicago & Indiana Coal.—Mr. W. E. Brimson has been appointed Chief Train Dispatcher, in place of Mr. T. A. Strayer, resigned.

Chicago, Kansas & Nebraska.—General Manager C. W. Fisher announces the appointment of Mr. B. Bailey as Chief Train Dispatcher of the First Division under Superintendent Allen, with offices at Horton, Kan. He has been in the dispatcher's office of the Rock Island, at Davenport, Ia., for the past 13 years.

Chicago & Northwestern.—General Passenger Agent E. P. Wilson issues the following, dated Dec. 1 : "Mr. J. F. Wiley having resigned the Eastern Passenger Agency of this company, Mr. A. H. Pride, as General Eastern Agent, will have charge of the passenger business in New York, Brooklyn, Hoboken, Jersey City, Philadelphia, Baltimore, Washington and Richmond. Mr. E. T. Monett is appointed Passenger Agent for the cities of New York, Jersey City, Brooklyn and Hoboken. He will report to Mr. Pride. New York office, 409 Broadway."

Colorado Midland.—The following circular from General Manager D. B. Robinson is dated Colorado Springs, Col., Nov. 22.

"The following organization of departments in the management of this road will take effect this date, except as noted below :

"1. Mr. Thomas H. Wigglesworth, as Chief Engineer, with headquarters at Colorado Springs, will have general charge of all matters pertaining to engineering construction and maintenance.

"2. Mr. F. E. Nelson, as Superintendent of Construction, with headquarters at Colorado Springs, will have active charge of tracklaying, and construction and maintenance of bridges, buildings, water service, and maintenance of road, reporting to the Chief Engineer. Engineers, firemen and train crews when on duty in construction service will be subject to his orders.

"3. Mr. William Fuller, as Superintendent of Machinery, with headquarters at Colorado Springs, will have charge of all rolling stock and machinery, and round-houses and machine shops after completion, and all employés connected therewith.

"4. Mr. J. H. Holway, as Purchasing Agent, with headquarters at Colorado Springs, will have charge of all material, stores and stationery.

"5. Mr. J. J. Blower will assume the duties of Auditor, Nov. 26, with headquarters at Colorado Springs, and will have entire charge of all accounts, with full power as to the regulation of the same in the various departments.

"All heads of departments will report to the General Manager."

Continental Line.—Mr. S. T. McLaughlin has been appointed General Manager of this fast freight line, with office in Cincinnati. He was formerly connected with the line, but for some years past has been General Manager of the Globe Line.

Danville & New River.—Maj. W. T. Sutherlin, of Danville, Va., has been chosen President of this company.

Drayton & Ironton.—General Superintendent J. E. Gimperling issues the following, dated Dayton, O., November 17. "The general offices of the company have been removed from Indianapolis to Dayton, O., where all correspondence pertaining to the business of this company should be addressed. The following appointments have been made, taking effect this date: N. P. Ramsey, Auditor, who will also have charge of Car Service Department; W. B. Williams, General Freight and Ticket Agent. The duties of Purchasing Agent will be performed by the General Superintendent."

Duluth, Red Wing & Southern.—This new company has elected officers as follows : President, F. W. Hoyt, Red Wing, Minn.; Secretary and Treasurer, J. F. Thompson, Duluth, Minnesota.

Evansville & Terre Haute.—G. J. Grammar, Traffic Manager, has issued the following circular : "W. B. Hallstead is appointed General Traveling Agent of this company, taking effect Nov. 18, 1886. He will have charge of the solicitation of both passengers and freight, and the advertisement of passenger business throughout the territory of Indiana, Illinois and the Northwest."

Georgia Pacific.—At the annual meeting in Birmingham, Ala., Nov. 29, the following directors were chosen: John W. Johnston, Birmingham, Ala.: Joseph Bryan, T. M. Logan Richmond, Va.; P. J. Goodhart, Emanuel Lehman, J. C. Maben, Isaac L. Rice, John A. Rutherford, George F. Stone, New York.

Gulf, Houston & Rio Grande.—The incorporators are: Abraham Cross, J. S. Mitchell, J. W. Smith, Dion Packard, P. W. Smith, J. B. Alley, J. C. Reiff, H. V. Newcomb, Edward Edes, E. D. Pray. Office in Houston, Texas.

Gulf & Ship Island.—The office of this company is at Ripley, Miss.; the officers are: W. H. Hardy, President; W. C. Falkner, Vice-President; Wm. Henry, Secretary.

Indiana & Illinois Southern.—Mr. F. E. Basler has been appointed General Freight and Passenger Agent, vice Mr. W. B. Hallstead. Headquarters, Sullivan, Ind. He was recently on the Evansville & Terre Haute.

Indiana & Southwestern.—The officers are : President Milton Mercer, Goshen, Ind.; Secretary, W. L. Stonex, Goshen, Ind.; Treasurer, Zimri D. Wiggins, Chicago.

Lake Shore & Michigan Southern.—The following circular from President Newell, announces changes heretofore noted; it is dated Cleveland, O., Dec. 1:

"Taking effect this date Mr. Addison Hills has been appointed Assistant to the President.

"Mr. E. Gallup has been appointed Assistant General Manager with office at Cleveland.

"Mr. Gallup will have charge of the transportation and passenger department and of such other business of the company as may be assigned to him by the General Manager."

Mr. George R. Hardy is to be Assistant Chief Engineer in place of I. N. Brewer, resigned, to date from Jan. 1. Mr. Hardy was recently on the Boston & Albany road.

Mississippi & Tennessee.—At the annual meeting in Memphis, Tenn., Nov. 24, the old directors were re elected, with the exception of Gen. A. M. West, who declined and was succeeded by Col. M. Lake, of Grenada, Miss. The board re-elected E. M. Harriman, President ; F. M. White, Vice-President ; M. Burke, General Superintendent.

Missouri Pacific.—It is announced that Mr. S. H. H. Clark, formerly General Manager of the Union Pacific, will succeed the late H. M. Hoxie as First Vice-President and General Manager of this company.

New York, Lake Erie & Western.—At the annual meeting in New York, Nov. 30, the following directors were chosen: John King, John G. McCullough, J. Lowber Welsh, Cortlandt Parker, Henry H. Cook, William Libbey, William A. Wheelock, William Whitewright, George W. Quintard, Ogden Mills, William L. Strong, William B. Dinsmore, Morris K. Jesup, James J. Goodwin, William N. Gilchrist, Josiah Belden, Joseph Ogden. Mr. Belden takes the place of Charles E. Loew, deceased, and Mr. Ogden that of Jacob Hays, retired. The board elected John King, President; S. M. Felton, First Vice-President; Andrew Donaldson, Third Vice-President; A. R. McDonough, Secretary; Edward White, Treasurer.

New York, Ontario & Western.—Mr. Byron D. Benson has been elected a director in place of Charles Duggin, resigned.

Norfolk & Western.—Mr. J. G. Osborne, Civil Engineer, late Trainmaster of the New River Division, has been appointed Engineer in charge of surveys and construction for the proposed extension of that division to the Ohio River; to take effect Dec. 1.

Mr. H. S. Handy has been appointed Trainmaster and Division Engineer of the New River Division, vice Mr. J. G. Osborne, transferred; to take effect Dec. 1.

Philadelphia & Reading.—The following appointments are announced: E. F. Smith, Engineer, appointed Superintendent and Engineer of Canals, with office at Reading, Pa. E. Chamberlain, Engineer, assigned to duty under M. F. Bonzano, Superintendent of the North Penn & Bound Brook Division and the Germantown & Norristown Branch, with office in Philadelphia. P. A. Taylor, Engineer, assigned to duty under J. H. Olhausen, Superintendent Mahanoy & Susquehanna Division, with office at Palo Alto, Pa. I. E. Umstead, Engineer, assigned to duty under George Eltz, Superintendent Main Line Division; office at Reading. W. G. Johnson, Engineer, assigned to duty under H. O. Tracy, Superintendent Schuylkill & Susquehanna and Lebanon & Tremont branches; office at Pine Grove, Pa. Division superintendents

will take charge of and be held responsible for all the safe and economical working of all systems.

Prospect Park & Coney Island.—The directors have elected Andrew R. Culver, President; A. C. Washington, Treasurer: H. A. Faron, Secretary.

St. Paul, St. Croix & Lake Superior.—The incorporators are: George F. Sabin, Stillwater, Minn.; John C. Maxwell, William Dawson, Jr., Samuel B. McConnell, Charles W. Copeley, Charles Hauser, St. Paul, Minnesota.

Southwestern Passenger Association.—Mr. John N. Abbott has been elected Commissioner of this Association. He is now General Passenger Agent of the New York, Lake Erie & Western road.

Utah Midland.—The office is in Salt Lake City, Utah. The incorporators are Eli H. Murray, John Lawrence, W. S. McCormick, F. H. Auerbach, P. H. Lannan, H. W. Lawrence, G. H. Erb and John A. Groesbeck.

Valley (Ohio).—Mr. N. F. Wood, having resigned the position of Superintendent, William M. Smith is appointed Superintendent, to take effect Dec. 1. Mr. Smith will have charge of transportation and telegraph.

White Bear Lake & Wisconsin.—The office is in St. Paul, Minn.; the incorporators are Wm. Dawson, E. D. Coming, W. A. Somers, R. A. Smith, H. H. Fuller, Wm. Dawson, Jr., W. K. Sach, and H. H. Horton.

Washington & St. Mary.—The officers of this company are: President, Andrew Albright, Newark, N. J.; Vice-President and Chief Engineer, J. H. Linville, Philadelphia; Secretary, Wm. H. Wile, Philadelphia; Treasurer, Thomas Cochran, Philadelphia.

Zanesville, Mt. Vernon & Marion.—Mr. Gideon E. Meigs, of Painesville, O., has been chosen President in place of A. E. Boone, resigned. Mr. Henry D. Lee, of Galion, O., has been chosen Vice-President.

PERSONAL.

—Mr. J. F. Humphrey has resigned his position as Auditor of the Colorado Midland Railway Company.

—Mr. John Porteous has resigned his position as General Freight Agent of the Grand Trunk road, to take charge of the Great Eastern line, with office in Boston.

—Mr. George R. Hardy has resigned his office as Assistant Engineer of the Boston & Albany Railroad, to accept a position on the Lake Shore & Michigan Southern road.

—Mr. Walton White Evans, for many years a prominent engineer, died at his home in New York, Nov. 28, aged 70 years. A notice of his life will be found in another column.

—Mr. Simon Cameron Wilson, Mayor of Harrisburg, Pa., died suddenly in that city, Nov. 29, aged 45 years. Mr. Wilson was at one time connected with the Northern Central road, and held the position of Superintendent of Telegraph.

Mr. William Woodcock, President of the Master Mechanics' Association and Master Mechanic of the Central Railroad of New Jersey, died at his home in Elizabethport, N. J., Nov. 27, aged 52 years. A more extended notice of his life will be found elsewhere.

—Mr. Gilbert C. Breed, for a long time connected with the Louisville & Nashville and lately with the Louisville, New Albany & Chicago Co., died at his residence in Louisville, Ky., Nov. 17, aged 57 years. A more extended notice will be found in another column.

—Mr. N. F. Wood has resigned his position as Superintendent of the Valley Railroad (Ohio) and will give up railroad business altogether, retiring to his farm. Mr. Wood was for a long time on the New York, Pennsylvania & Ohio, and went to the Valley road only two months ago.

—Mr. Leander Garey, formerly Superintendent of the Car Department of the New York Central & Hudson River Railroad, and for many years President of the Master Car-Builders' Association, died at his residence at Hartsdale, N. Y., Nov. 23, aged 59 years. An account of his life will be found elsewhere.

—Mr. Horace E. Horton, of Rochester, Minn., is Engineer and Contractor for the new bridge over the Mississippi river, at Dubuque, Ia. The pontoon bridge plan has been abandoned in favor of an iron bridge. *Engineering News* says that Mr. Horton is one of the few rich civil engineers in this country and that he will build the bridge with his own money.

—Mr. Adam Driesbach, for many years a railroad contractor, died suddenly in Bloomsburg, Pa., Nov. 29, aged 64 years. He had many contracts for canal and railroad work, chiefly in Pennsylvania. Among his more important works were the building of a large part of the New York & Canada road along the west shore of Lake Champlain for the Delaware and Hudson Canal Co., and the Delaware & Bound Brook road in New Jersey. At the time of his death he was building the Bloomsburg & Sullivan road.

—Mr. Francis Palms, one of the oldest business men of Detroit, Mich., died in that city, Nov. 24, aged 76 years. He was born in Belgium, but came to this country and settled in Detroit in 1833. He accumulated a large fortune by buying government lands and selling them in small tracts to settlers. At the time of his death he still held large tracts of timber lands in Michigan and Wisconsin. He was interested in many local business and railroad enterprises, and was one of the first incorporators of the Detroit, Mackinac & Marquette Railroad Co., in which he was a large stockholder.

—Mr. John N. Abbott, who, it is said, will resign his position as General Passenger Agent of the New York, Lake Erie & Western road to become Commissioner of the Southwestern Passenger Association, has been connected with the Erie for 25 years, entering its service when 16 years old, in 1861, as a clerk. He rose rapidly and in a few years became Chief Clerk in the general ticket office. In 1869 he was appointed Assistant General Passenger Agent and in 1872 General Passenger Agent. Few men in the passenger service are better known or have so great and well deserved popularity as Mr. Abbott.

—Mr. Thomas Little, the engineer whose devotion to duty on the night of the railroad disaster at Rio saved many lives, was presented by the venerable Bishop Whipple, of Minnesota, with a gold medal, at Portage, Wis., Nov. 23. The Bishop was on his way home from Philadelphia, where he had the token struck off at the United States Mint. The obverse side bears the inscription, "Bishop Whipple to Thomas Little," and the reverse, "For his heroism in saving the lives of passengers at Rio, Wis., Oct. 28, 1886." The medal is plain but neat, being a little smaller than a silver dollar. The recipient was taken entirely by surprise.

—Mr. Edward Sheldon, Cashier of the Lake Shore & Michigan Southern Co., died in Cleveland, O., Nov. 26. He had been in the company's service nearly 35 years. He was born in Hartford, Conn., and went to Cleveland in 1852, where he took a position as conductor on the Cleveland & Toledo road. The road was not entirely completed in October of that year, when Mr. Sheldon started out of Norwalk in charge of the first passenger train on the road. Soon after he was appointed station agent of the Cleveland & Toledo at Cleveland, the office at that time being located on the West Side. Another promotion made him Paymaster of the road, and he filled that position when the line was consolidated with the Lake Shore, in 1869. For a short time he was Assistant Paymaster of the Lake Shore, but was transferred to the Treasurer's office as Assistant Cashier, and became Cashier when Mr. Bartlett was appointed Treasurer.

—Mr. S. H. H. Clark, who, it is announced, will succeed Mr. H. M. Hoxie as First Vice-President and General Manager of the Missouri Pacific Co., was for a number of years connected with the Union Pacific. Mr. Clark began railroad work as conductor on a construction train on the Central Railroad of New Jersey, and gradually worked his way up. He went to the Union Pacific as Division Superintendent, and was promoted to be General Superintendent, and afterwards General Manager of the road, holding that position until 1884, when he was compelled to resign on account of his health. Mr. Clark's intention at that time was to retire altogether from railroad service, but he gradually resumed work, taking charge of the construction of the Omaha Belt Line, and afterwards of the interests of the Missiouri Pacific in Omaha. He will have his headquarters in St. Louis.

—At a meeting of the directors of the Missouri Pacific Co., held in New York, Nov. 26, the following resolutions were adopted:

"*Resolved*, That the death of H. M. Hoxie, First Vice-President of this company, and General Manager of its railways, is deplored by us, not less from his great value to the business interests in our charge than from affectionate respect inspired by the manliness and integrity of his whole personal life.

"*Resolved*, That his death is recognized as in large measure due to his faithful maintenance of private right against anarchic passion during the organized attack upon the property and business of this company which was made early this year.

"*Resolved*, That his firmness in that crisis did more, perhaps, than any single cause to preserve results of industry in the United States from a wave of spoliation and disorder which no other interest could probably have withstood if the rights of this company had been at that time overthrown.

"*Resolved*, That we share the sorrow of his family and those who were cherished by him with a feeling of sympathy for them which is enhanced by our knowledge of his worth.

"*Resolved*, That a copy of these minutes be sent to Mrs. Hoxie as a token of personal regard."

The New York *Evening Post* of Nov. 24 says: "The death of H. M. Hoxie was, in the estimation of his nearest friends, hastened by the severe labor and anxiety imposed upon him by the great Southwestern strike of last spring. It is a fact that, although he held up bravely till the last, and saw victory securely in his own hands, he became immediately thereafter a prey to an ailment which brought great physical suffering, and to which he finally succumbed. If he had not been subjected to the terrible ordeal arranged for him by Martin Irons and his misguided followers Mr. Hoxie would undoubtedly be alive and well to-day. He has fallen a martyr to high duty, and his name and example will be long cherished by his countrymen as those of a true hero. Before Hoxie took his stand against the extensive and multiplying system of boycotts by which all industry, and especially railroad transportation, was plagued and threatened, it was customary for everybody to yield to it. After he had fought against and beaten it everybody else fought against it, and presently courts and juries sat down upon it. No finer instance can be found of the wholesome effect of splendid although unintentional leadership in a great crisis."

TRAFFIC AND EARNINGS.

Petroleum.

The production, shipments, etc., of the Pennsylvania and New York oil wells in October are given by *Stowell's Petroleum Reporter* as follows, in barrels of 42 gallons:

	1886.	1885.	Inc. or Dec.	P.c.
Production	2,408,111	1,874,105	I. 534,006	28.5
Shipments	2,441,848	2,050,150	I. 391,698	19.1
Stock, Oct. 31	35,027,877	34,763,857	I. 264,020	0.8
Producing wells	25,303	23,062	I. 2,241	9.7

Of the total production the Allegheny District in New York furnished 6.0; the Bradford District in Pennsylvania, 23.2; the Warren District, 15.5; the Lower District, 36.1; and the Washington District, 19.2 per cent.

Stock was increased during the month by 33,737 barrels, being the excess of shipments over production.

Shipments for the month were divided as below:

	Crude.	Refined.	Total.	P. c
New York	598,568	60,577	659,145	27.0
Philadelphia	894,347	149 124	1,043,471	42.7
Baltimore	99,051	16,876	115.927	4.8
Boston	20,162	56,538	76,700	3.2
Cleveland	175,979	... .	175,979	7.2
Pittsburgh	93.900	... .	93,900	3.8
Local points	194,898	81,828	276,726	11.3
Total	2,076,905	361,943	2,441,848	100.0

In this table the refined oil shipped is that refined at the Creek refineries in the oil region; it is reduced to its equivalent in crude, so that the totals represent the amount of oil hipped to each place, whether in crude or refined form.

Cotton.

Cotton movement for the week ending Nov. 26 is reported as below, in bales:

Interior markets:	1886.	1885.	Inc. or Dec.	P c.
Receipts	178,382	187,422	D. 11,040	5 9
Shipments	147.484	156,278	D. 8.794	5.6
Stock, Nov. 26	366,078	340,405	I. 25,673	7 5
Seaports:				
Receipts	280,262	259,925	I. 20,337	7.8
Exports	186 463	137,485	I. 48,978	35.6
Stock, Nov. 26	919,883	855,738	I. 64,145	7.5

The total shipments from plantations for the crop year to Nov. 26 are estimated at 2,943,978 bales, against 2,962,993 last year, 2,903,643 in 1884 and 2,931,551 in 1883.

Southern Passenger Association.

The Southern Passenger Association met in Atlanta, Ga., Nov. 23, with a large attendance. The Association considered the rules and regulations governing passenger business, formulated at its last meeting, and adopted them. They will be announced to agents and the public shortly.

San Francisco Passenger Association.

At the meeting held last week in Chicago it was agreed that the agreement of Oct. 23, adopted at the San Francisco meeting, be continued in force until Dec. 6, pending the consideration of the proposed agreement. The report of the committee appointed to prepare a permanent agreement was discussed and amended. A committee was appointed to secure the assent of all parties in interest to this agreement.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1886.	1885.	Inc. or Dec.	P. c
Ten months to Oct. 31:				
Buff., N. Y. & P.	$2,170,744	$1,998,670	I. $172,074	8.6
Net earnings	468,918	493,790	D. 84 872	17.2
Camden & Atl	547,684	502,614	I. 35,070	7.0
Net earnings	141,104	142,116	D. 1,012	0.7
Des. M. & Ft. D.	274,706	309,115	D. 34,319	11.1
Grand Rap. & I.	1,681.707	1,604.095	I. 77,612	4.8
Net earnings	587,095	475,874	I. 111,221	23.4
Mem. & Charles.	1,091,432	1,029,953	I. 61.479	6.0
Net earnings	337,565	175 299	I. 162,269	92.6
N. Y., Sus. & W.	909,160	908,606	I. 554	0.1
Norfolk & West.	2,647,012	2,251,056	I. 395,956	18.0
Net earnings	1,067.443	895,265	I. 172,178	19.0
Northern Pacific.	19,129 931	9.324.970	I. 805.011	8.6
Net earnings	5,007,418	4.537,605	I. 469,813	10.3
Pennsylvania	41,603,635	37,596,806	I. 4,006 8:9	10.6
Net earnings	14,834,581	13,159.784	I. 1,674,797	12.7
Phila. & Reading	24,933,350	23,971,559	I. 967,791	4 0
Net earnings	10,280.769	9,995,211	I. 285,558	2.9
Valley (Ohio)	501,858	.....	.....	....
West Jersey	1,173,735	1,113,765	I. 59,970	5.4
Net earnings	458,442	431 381	I. 27,091	6.3
Nine months to Sept 30:				
Georgia Pacific	$561,697	$453,038	I. $110,659	24.4
Lake S. & M. So.	11,247,177	10.165,015	I. 1,082.162	10.6
Net earnings	4,205,029	3,239.771	I 965.258	29.8
Miss. & Tenn	263,388	313,255	D. 49,867	15.9
Peoria, Dec. & E.	591,969	542,461	I. 49,508	9 1
Net earnings	295,936	242,986	I. 52,950	21.8
Month of September:				
Catawissa	$132,000	$119,000	I. $12,000	10.9
Georgia Pacific	87.715	62,069	I. 25,646	41.3
Miss. & Tenn	32.671	30,737	I. 1,334	4.3
Peoria, Dec. & E.	90,481	79,156	I. 11.325	14.3
Net earnings	54,412	40,439	I. 13,972	34.8
Month of October:				
Buff., N. Y. & P.	$227,384	$240,662	D. $13,278	5.5
Net earnings	36,892	62.663	D. 25,771	40.9
Camden & Atl	37,048	33,750	I. 3,298	9.8
Net earnings	4,320	1,223	I. 3,097	253.2
Des M. & Ft. D.	35,538	42,025	D. 6,487	15.1
Grand Rap. & I.	200,740	198,252	I. 2,488	1.2
Net earnings	74,847	67,730	I. 7,117	10.5
Memphis & Chas.	160,908	133,794	I. 27,114	20.2
Net earnings	82,098	49,706	I. 32,392	64.8
N. Y., L. E. & W.	1,851,019	1,623,737	I. 227,282	14.0
Net earnings	749,208	672,635	I. 76,573	11.4
N. Y., P & Ohio.	564,471	524,869	I. 39,602	7.5
Net earnings	209,236	169,733	I. 39,503	23.2
N. Y., Sus. & W.	109,868	105,087	I. 4,781	4.6
Northern Pacific.	1,443,667	1,522,285	D. 78,618	5.2
Net earnings	874.661	868,614	I. 6.047	0.7
Norfolk & West.	334,712	285,981	I. 48,731	17.0
Net earnings	147,460	143,723	I. 3,737	3.0
Pennsylvania	4,737,348	4,359,171	I. 378,177	8.6
Net earnings	1,859,746	1,935 811	D. 76,065	4.0
Phila. & Reading	3,011,482	2,878,370	I. 133,112	4.6
Net earnings	1,353,840	1,418,070	D. 64,230	4.5
St. L., Ft S. & W.	101,963	69.765	I. 32,198	46.0
Valley (Ohio)	57,721	47,513	I. 10,208	21.5
West Jersey	96,595	95,704	I. 891	0.9
Net earnings	39,596	37,488	I. 2,108	5.7
Third week in November:				
Buff., Roch. & P.	$28,010	$27,551	I. $459	1.7
Cairo, V. & C.	16,053	11.579	I. 4,474	38.6
Canadian Pacific	248.000	186,000	I. 62,000	33.3
Chic. & Atlantic	33,564	26 969	I. 6.595	24.4
Chi. & East. Ill.	44,962	47,214	D. 2,252	4.8
Chi. Mil. & St. P.	517,000	634.479	D. 117,479	18.5
Chic. & N. W.	495,500	567,500	D. 72,000	12.7
C., St. P., M. & O.	132.500	144,700	D. 12,200	8.4
C., I., St. L. & C.	47,500	45,800	I. 1,700	3.7
Illinois Central	262,200	309,289	D. 47.089	15.2
Iowa lines	28,200	44.756	D. 16.556	36.8
Long Island	51,420	50,144	I. 1,276	2.5
Louisv. & Nash.	299,545	271,640	I. 27,905	10.3
Manhattan Elev.	156,779	144,082	I. 12,697	8.8
Mexican Central	89.550	78,250	I. 11,300	14.5
Mil., L. S. & W.	46.101	31,390	I. 14,711	47.8
Mil. & Northern	13,981	12.715	I. 1,266	10.0
Northern Pacific	297.139	304.670	D. 7,531	2.5
St. L. & San F.	108,100	121,914	D. 13.81-	11.3
St. P. & Duluth	34,016	38,540	D. 3,624	9.4
Wab., St. L. & P.	246,000	279,000	D. 33,000	11.5

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Chicago Shipments Eastward.

The Board of Trade reports east-bound shipments from Chicago for the week ending Nov. 27 as follows, in tons:

	Tons.	P. c.		Tons.	P.c.
Chi. & Gd. Trunk	2,625	7.4	Pitts., Ft. W. & C.	5,679	16.0
Mich Central	3.795	10.7	Chi., St. L. & Pitts.	5,701	16.1
Lake Shore	5,686	16.0	Balt. & Ohio	5,471	15.5
N. Y., Chi. & St. L.	3,644	10.3	C., Ind., St. L. & C.	2,851	8.0

The statement includes local as well as through shipments. The total for the week was 35,462 tons, being less by 2,947 tons, or 7.7 per cent., than the previous week. The shipments are the lightest reported for over eight weeks past.

Shipments for eight weeks past by these reports have been, in tons:

Week ending							
Oct. 9.	Oct. 16.	Oct. 23.	Oct. 30.	Nov. 6.	Nov. 13.	Nov. 20	Nov. 27.
43,556	41,347	45,820	46,688	41,883	37,051	38,409	35,462

Shipments by the Chicago & Atlantic road are not included above; the through tonnage by that line for the week ending Nov. 27 is given at 4,143 tons. These shipments include dead freight only.

Coal Barges versus Schooners.

The Boston *Herald* says: "For years the great supply of coal brought to this port, for use here or for delivery along the long line of railways that, stretching from tide-water, reach out into the many manufacturing places of New England, has found transportation from coal ports by means of sailing vessels, mostly schooners, and a great and magnificent fleet of these vessels has sprung into existence and been able to pay handsome dividends to their owners and agents, besides giving employment to a vast number of sailormen. This fleet consists mostly of three-masted schooners, built at great expense, for this particular trade, and while our deep-water vessels have continued gradually to disappear from the ocean highway the sails of these colliers have whitened the bays and sounds of our shores, lined our docks and given employment to sail, spar and boat builders without number. For a long time, these sailing vessels have all but controlled the coal trade between the coal ports and Boston, the fleet of iron steamers belonging to the Philadelphia & Reading Coal & Iron Co. getting only that company's own trade, with an outside steamer or two occasionally making a coal trip. Within five years, however, a new, important and what is likely, in the future, to prove a disastrous factor for sailing vessels—coal barges towed by powerful steamers—has entered the business, and has vastly reduced the charges of transportation, as well as the chances for the schooners to secure paying rates. Most of these barges are sailing vessels cut down and rebuilt to suit the coastwise coal trade. While the schooners have to carry large crews, are fitted with expensive sails and running gear and are subject to constant detention by the fickleness of the winds and tides, the coal barges, two or three of them, strung out on long hawsers, towed by powerful tugs,

push along the coast from the receiving to the delivery port slowly, but surely, delayed only by heavy weather, which is as much to be dreaded by the schoonermen as by him who sails a barge. These barges, many of them, have two or three masts, hoisting small fore and aft sails, and are provided with steam power for delivering cargo, hoisting ground tackle, etc. The barges are also heavy carriers, 1,200 to 2,000 tons being the cargo of a majority.

"When the idea was first advanced that barges could be successfully used in the Boston coal trade, the idea was laughed at. 'You can never get them over the shoals and around Cape Cod,' said the towboatmen, 'except in exceptionally smooth weather, and waiting for such chances will eat up the profits; in winter, especially, such heavy weather prevails at all times along the cape that then the business will surely prove unprofitable; more barges will be lost than can be got to port,' and a thousand other difficulties were enumerated. The tug 'America,' with two barges, owned by a New London concern, was the first to make the venture, and it proved successful, and now a fleet of these craft, owned in Boston, have entered the business, and it is said are making money in it, and driving the handsome schooners out of the trade. The largest concern in this trade at present is the Boston Towboat Co. This concern already has seven large barges running, and will soon have many more."

Rates on California Fruit.

The Fruit-growers' Committee desired to secure from General Manager Towne, the following fruit transportation rates: Passenger train time to New York, Philadelphia and Boston, $400 per car; passenger train to Chicago, $300 per car; slow freight to Chicago, $200: that 10 cars hereafter comprise a $300 fruit train. Manager Towne intimated that the sweeping reduction asked for could not be granted, as it would be impossible, in his opinion, to make terms with eastern lines that would permit it. A willingness, however, was intimated to attach fruit cars to regular passenger trains as far as Chicago at $500 per car, or to carry freight at $250 per car. Mr. Towne promised to consult eastern lines, however, in regard to the whole matter. The present rates East are as follows: Passenger time to New York, $800; slow freight, $400; passenger time to Chicago, $600; slow freight, $300.—*San Francisco Bulletin, Nov.* 24.

Trunk Line Presidents' Meeting.

A meeting of the Trunk Line Presidents was held at Commissioner Fink's office in New York, Dec. 1. The meeting was harmonious, but no business of special importance was transacted.

Central Traffic Association.

A Chicago dispatch of Nov. 23 says that a conference was held on that day at which, after some discussion, the fact was conceded that the Chesapeake & Ohio was not necessarily to be regarded as a formidable rival of the Central Traffic Association. Both parties then agreed to do the best they could to promote each other's interests. The Chesapeake & Ohio promised to maintain by its all rail lines the Central Traffic Association's all rail rates. The differentials heretofore awarded the Chesapeake & Ohio road on business taken by its water route will be continued. That road will also charge Baltimore rates on business taken by it to Newport News. It was also agreed that the Central Traffic Association and the Chesapeake & Ohio will hereafter exchange statistics.

The arbitrators have agreed on a report on divisions in the Peoria pool, and their award is as follows, compared with old divisions:

	New award.	Old
Chicago, Rock Island & Pacific	21⅛	20⅛
Indiana, Bloomington & Western	21½	20
Toledo, Peoria & Western	21	19⅛
Peoria, Decatur & Evansville	18	19½
Wabash, St. Louis & Pacific	15⅛	15½
Illinois Midland	2½	5
Total	100	100

It is thought that no further rehearing in this case will be asked for.

Western Traffic Association.

A Chicago dispatch of Nov. 30 says: "The General Managers of the roads in the Western Traffic Association failed to agree upon percentages for the Omaha, Council Bluffs and Papillion local pool and range cattle pool at the time the Association was formed. Therefore, in accordance with the terms of the agreement, Commissioner Faithorn was instructed to fix percentages for those pools, and to-day announces the following:

	Old Percentages.	New Percentages.
Burlington	23⅛	26⅛
St. Paul	19½	19½
Northwestern	19½	19½
Rock Island	19½	21
Wabash	18	13⅛

"As will be seen, the Wabash is the only road whose percentage has been cut down. It is provided that in case any road is dissatisfied with the award of the Commissioner it may appeal therefrom, when another arbitration shall be had, the decision of this second board of arbitration to be final.

"Commissioner Faithorn's award for the roads in the range cattle pools is as follows: Northwestern, 29 per cent.; Burlington, 25 per cent.; St. Paul, 20 per cent.; Rock Island, 20 per cent.; Wabash, 6 per cent. These percentages cannot well be compared with those formerly in effect, as the new pool is differently organized and covers different territory. Under the old arrangement the Northwestern had about 60 per cent. of that tariff, but under that arrangement the business from its Fremont, Elkhorn & Missouri Valley extension was all included. Under the new arrangement the business from that line east of Douglass (Fort Fetterman) is excluded, and only that from points west of Douglass goes into the pool."

Southern Railway & Steamship Association—False Classification of Freight.

The following circular from General Commissioner Powers has been issued, dated Atlanta, Ga., Nov. 24:

"The reports of our inspectors show that numerous ways are devised to avoid classification, and that large quantities of apples and onions are being shipped as potatoes. Large quantities of fine furniture are also being shipped as common furniture. They also find large weights allowed as salt, to preserve meat in transit (not over 5 per cent. should be allowed for salt); pigs' feet, pickled, shipped as bacon or pork; linseed, other oils as grease; plaster of Paris, mineral paint, etc., as land plaster; window and plate-glass as floor lights, and numerous other irregularities.

"All general freight agents are hereby requested to instruct their agents to carefully examine all business handled by them, and see to it that it is billed correctly, and instruct their delivering agents to see that all shipments that have not been properly billed or classed, are correctly billed up to proper weight and classification.

"All lines are hereby notified that bills of lading giving improper weights or classification, or other irregularities, will not be protected by the lines of this association, and that waybills will be 'set up.'

"Our Inspector will visit each place as promptly and as often as possible, and officers and agents are requested to extend to them all assistance possible to aid them in the detection of false weights and classification. I request that all general freight agents issue a circular concerning weighing, correct classification of all shipments, car load and less, etc. Such a circular has been issued by the General Freight Agent of the East Tennessee, Virginia & Georgia Railway."

Coal.

Coal tonnages for the week ending Nov. 20 are reported as follows:

	1886.	1885.	Inc. or Dec.	P.c.
Anthracite	750,716	829,168	D. 78,452	9.4
Eastern bituminous	278,723	252,676	I. 26,047	10.3
Coke	95,514	59,929	I. 35,585	59.3

Anthracite coal trade is not active, owing to continued mild weather, which keeps back the demand for domestic purposes. The allotment for December has been fixed at 2,500,000 tons.

The bituminous coal trade is good, and there has been a slight increase in prices, due in part to a better understanding among shippers.

Pennsylvania Railroad coal tonnage for the week ending Nov. 20, was:

	Coal.	Coke.	Total.	1885.
Line of road	157,011	87,406	244,417	207,977
From other lines	80,166	8,108	88,274	101,800
Total	237,177	95,514	332,691	309,777
Year to Nov. 20	10,262,088	3,124,759	13,386,847	12,383,389

Increase for the week, 22,914 tons, or 7.4 per cent.; increase for the year, 1,003,458 tons, or 8 1 per cent.

Anthracite coal tonnage passing over the Belvidere Division, Pennsylvania Railroad, for the eleven months to Nov. 27 was:

	1886.	1885.	Inc. or Dec.	P.c
Coal Port for shipment	73,859	105,258	D. 31,399	29.7
S. Amboy "	452,076	515,436	D. 63,360	12 3
Local points on N. J. divs.	821,842	784,193	I. 37,649	4.8
Co.'s use " "	218,497	201,079	I 17,418	8.7
Total	1,566,274	1,605,966	D. 39,692	2.5

Of the total this year 1,344,500 tons were from the Lehigh Region, and 221,774 tons from the Wyoming Region.

Actual tonnage passing over the Huntingdon & Broad Top road for the eleven months to Nov. 27 was:

	1886.	1885.	Inc. or Dec.	P. c.
Broad Top coal	345,460	153,740	I. 191,720	124.7
Cumberland coal	252,880	419,050	D. 166,170	39.6
Total	598,340	572,790	I. 25,550	4.5

The Broad Top coal is mined on the line; the Cumberland is carried through from Mt. Dallas to Huntingdon for the Pennsylvania Railroad.

The coal tonnage of the Pennsylvania Railroad Division of the Pennsylvania Railroad for the eleven months to Nov. 27 was:

	1886.	1885.	Increase.	P.c.
Coal	10,476,920	10,322,424	154,496	1.5
Coke	3,210,387	2,355,634	854,753	36.3
Total	13,687,307	12,078,058	1,069,249	7.9

This includes all tonnage passing over the road, whether originating on the line or received from other lines. The details of this tonnage were as follows:

	Line of road.	From other lines.	Total.
Anthracite coal	1,578,297	2,680,030	4,258,327
Bituminous coal	5 015,409	1,183 184	6,218,593
Coke	3,161,807	48,580	3,210,387
Total	9,775,513	3,911,794	13,687,307

Of the total tonnage anthracite coal thus formed 31.1 per cent., bituminous coal 45.4 and coke 23.5 per cent. Of the total tonnage 71.4 per cent. origiuated on the line of the road.

Cumberland coal shipments for the eleven months to Nov. 27 are reported by the Cumberland *Civilian* as follows:

	1886.	1885.	Decrease.	P c.
Balt. & Ohio R. R.	1,785,454	1,823,591	38,137	2.1
Bedford Div., Penna. R. R.	226,118	376,607	150.489	39.9
Ches. & Ohio Canal	278,862	354,469	75,547	21.4
Total	2,290,434	2,554,607	264,173	10.3

Local deliveries to Cumberland and adjacent points are included in the Baltimore & Ohio shipments.

Buffalo Grain Traffic.

Buffalo grain receipts by lake from the opening to Nov. 30 have been as follows for four years past, flour in barrels and grain in bushels, flour being reduced to wheat in the totals:

	1886.	1885.	1884.	1883.
Flour	4,326,346	2,783,558	2,500,586	2,057,731
Grain	71,403,223	48,909,271	55,455,299	65,331,567
Total, bushels	93,034,953	62,827,761	67,958,229	75,620,222

The receipts this year have been the largest since 1880. The flour receipts are the heaviest on record.

For the same period shipments eastward of grain received by lake were, in bushels:

	1886.	1885.	1884.	1883.
By canal	45,407,534	31,714,027	38,078,467	42,609,204
By rail	19,146,057	10,539,545	11,387,710	15,618,366
Total	64,553,591	42,253,572	49,466,117	58,227,570
Per cent. by rail	29.7	24.9	23.0	26.8

The canal opened May 1 this year; May 11 last year; May 7 in 1884 and May 7 also in 1883.

RAILROAD LAW.

Taxation of Railroads in Georgia.

In the case of the Mayor and City Council of Augusta against the Central Railroad & Banking Co., the Georgia Supreme Court holds as follows:

The right to tax railroads and the property used by them in their business as common carriers, is reserved to the state, and no municipal corporation has any power to lay such a tax. Therefore where the ordinance of a city "to fix the annual and specific taxes * * on business occupations and professions for the year 1886, and to provide for the collection of the same," levied a tax of $500 on all railroads, and executions were issued therefor, their enforcement was properly enjoined, it appearing that the complainant companies did no other business in the city except such as was authorized by their charters, as carriers of freight and passengers.

Rights of Preferred Stockholders—Improvement Paid out of Earnings.

In Washington, Nov. 29, the United States Supreme Court rendered a decision in the case of the New York, Lake Erie & Western Railroad Co. against T. Nickals and Sidney Clavis, brought to it by appeal from the Circuit Court for the Southern District of New York. This was a suit brought by the preferred stockholders of the railroad company to compel the latter to make a dividend of 6 per cent. upon its preferred stock for the year ended Sept. 30, 1880, payable out of the net profit accrued that year, after the payment of operating expenses, interest, etc. In the Court below a judgment was rendered against the company for $20,280, which is the amount to which Nickals and Clavis would have been entitled if the dividend in question had been made upon the preferred stock. The case was also referred to a special commissioner to ascertain the names of all other persons entitled to receive similar dividends. The contention of the stockholders in this case is that the sum of $1,790,620, which the board of directors stated in their report to be the net profit for the fiscal year 1879-80, constituted a trust fund chargeable primarily with the payment of a 6 per cent. dividend upon preferred stock. The use of that fund for any other purpose was, it is maintained, a breach of trust on the part of the company and a violation of the rights secured to preferred stockholders as well by the plan and agreement of Dec. 14, 1877, as by the company's articles of association. This view of the case the United States Circuit Court adopted and rendered a decree in favor of the stockholders.

The Supreme Court, however, in a carefully prepared opinion by Justice Harlan, reverses that decree, and holds that, while the agreement of 1877 and the articles of association imply the right of preferred stockholders to a dividend in advance of common stockholders, neither of them is entitled of right to dividends in any year when there were profits from the operations of the company, unless the directors declared a dividend payable out of such profits. As the evidence shows that the profits for the year ended Sept. 30, 1880, were applied by the company to objects that were legitimate and proper, in view of the condition of its property as a unit, and of its affairs as a whole, there is no ground to suppose that the directors acted in bad faith when they refused to declare a dividend for that year. The Court is, therefore, satisfied that the complainants are not entitled to recover. The decree is reversed, and the case remanded with directions to dismiss the bill.

A "Black List" Case.

In New Haven, Conn., Nov. 30, William H. Wallace, Assistant Superintendent of the New York, New Haven & Hartford Railroad, and Stacey B. Opdyke, Superintendent of the New Haven & Northampton Railroad, were arrested, charged with conspiracy against Thomas Meaney, lately employed by those roads. Vice-President Reed furnished the nominal bond required. Meaney alleges that after working 11 years for the Northampton Co., he resigned and went to work for the New York road. In less than three weeks, however, he was discharged by order of Superintendent Wallace, because his employment was objectionable to Superintendent Opdyke, and he has since been out of work. This case is of great interest to the labor organizations and to employés generally, as being a test case in relation to the so-called "black lists," which some railroad officers keep.

OLD AND NEW ROADS

Atchison, Topeka & Santa Fe.—The Boston *Advertiser* of Nov. 29 says: "The Atchison Co. sold yesterday to Messrs. Kidder, Peabody & Co., acting for themselves and others, the $2,000,000 California Southern 6 per cent. first mortgage bonds, issued against repairs of old and on new mileage, under the agreement by which the road was put in order and extended. The price is said to have been 107 and interest. The issue is at the rate of $10,000 per mile.

"Further details in regard to Judge Brewer's decision in the Venner suits give a little different aspect to the matter, as they show that the main cases are still undecided. The decision was on the application of Mr. Venner for restraining orders in the Atlantic & Pacific and the Chicago extension cases, pending decisions on motions for permanent injunctions, which will be argued before Judge Brewer at St. Paul, Minn., Dec. 20, when argument will also be made on the amended bill in the Gulf, Colorado & Santa Fe suit. In the Chicago extension case the Atchison company denied any intention of building to Chicago, and its officers testified that no money of the company had been expended for surveys, etc. On this testimony Judge Brewer held that no harm could be done before Dec. 20, and there was, therefore, no occasion for a restraining order. He also denied a restraining order in the Atlantic & Pacific case, as no danger was imminent before Dec. 20, and the plaintiff had legal remedy."

Atlanta & Hawkinsville.—The location of the first division of this projected road is completed, and a contract for the grading has been let to the Chattahoochee Brick Co., of Columbus, Ga. This division extends from Atlanta to Senoia, 33 miles, and the work is to be finished by April 1 next. The engineers are now locating the line from Senoia to Hawkinsville.

Baltimore & Ohio.—The Baltimore *Sun* of Nov. 30 says: "The statements and counter-statements concerning negotiations between the Baltimore & Ohio and the Pennsylvania Railroad companies for an arrangement by which the Baltimore & Ohio would use a portion of the tracks of the Pennsylvania corporation, continue to be a leading topic in financial and railroad circles. The Baltimore & Ohio interest, until to-day, had nothing to say beyond merely oracular utterances that were not satisfying because indefinite. Philadelphia has been all along the centre from which the reports emanated, and the situation there has seemed to change several times. The latest statement was made by the Philadelphia *Press* of yesterday to the effect that previous propositions made to the Baltimore & Ohio had not met the approval of that company, and that the Pennsylvania will make a new offer, which will include a proposal for both companies to have freight terminals on Staten Island, and for the Pennsylvania to build the Arthur Kill bridge.

"From an undoubted authority on the Baltimore & Ohio side the position which that company assumes is given now with a directness that can hardly be misunderstood. The points are as follows:

"First. It is denied that there is any idea on the part of the Baltimore & Ohio of abandoning its purpose to have an independent line to New York.

"Second. The Baltimore & Ohio believes that its contract with the Reading is binding and effective, and this includes the arrangement for the use of the Reading and the Jersey Central tracks between Philadelphia and New York.

"Third. In the event of any possible interruption of these arrangements, an independent line will be built from Philadelphia to Staten Island. There will be no lack of money to push it, and to that end a large fund is already in existence.

"Fourth. The Baltimore & Ohio will not permit itself to be forced to use the tracks of the Pennsylvania road, known as the United Railroads of New Jersey, between Philadelphia and New York.

"Fifth. The Baltimore & Ohio will continue to recognize the claims of the public to have the advantages of fair railroad competition. It will keep its promises to them that the Baltimore & Ohio will establish a line between Baltimore and New York that will be as independent as is its line between Washington and Baltimore."

Birmingham, La Grange & Macon.—This company has filed articles of incorporation in Alabama to build a railroad from Birmingham eastward to the Georgia line, to connect there with another line to be built to Macon, Ga. The capital stock is fixed at $500,000.

Bloomsburg & Sullivan.—Work is now in progress on this road, which is to run from Bloomsburg, Pa., through the Fish Creek Valley and around North Mountain to Bernice, the terminus of the State Line & Sullivan road. The distance is 27 miles, through a country abounding in coal and lumber.

Boston & Lowell.—It is stated that a traffic contract has been practically concluded between this company and the Canadian Pacific, under which the Canadian Pacific's business to Boston and other New England points will pass over the Boston & Lowell line. This contract will take effect as soon as the Canadian Pacific completes its bridge over the St. Lawrence River and its connection south of Montreal.

Boston & Maine.—The current Boston report is that arrangements have been completed to consolidate the Eastern and the Maine Central companies with this company as soon as the necessary legislative authority can be obtained.

It is also again reported that negotiations are in progress for the transfer of the Boston & Lowell and its leased lines to this company either by sale or lease, such transfer to be preliminary to a consolidation of the two systems.

Camden & Atlantic.—The statement for October and the ten months to Oct. 31 is as follows:

	October		Ten months.	
	1886	1885.	1886.	1885.
Earnings	$37,048	$33.750	$537.684	$502,614
Expenses	32,728	32,527	396,580	360,498
Net earnings	$4,320	$1,223	$141,104	$142,116
Interest, rentals, etc.			83,302	85 970
Surplus			$57,802	$56,146

For the ten months the gross earnings increased $35,070 or 7.0 per cent.; the expenses increased $36,082, or 10.0 per cent., and the net earnings decreased $1,012, or 0.7 per cent. The fixed charges decreased $2,668, or 3.1 per cent., leaving a gain of $1,656, or 2.9 per cent., in the surplus.

Carolina Central.—The bridge over the Broad River was completed last week and the tracklayers reached Rutherfordton Dec. 1. The extension from Shelby to Rutherfordton is 27 miles long, making the Western Division of the road, from Charlotte, N. C., to the new terminus, 81 miles in length.

Central Iowa.—The directors of this company have been discussing the question of a reorganization and have, it is said, decided that a receivership, and foreclosure will be necessary. President Stickney, who recently assumed that position, is reported as saying that the net earnings of the road will probably not be over $260,000 yearly, and that the fixed charges must be reduced to that amount. He suggests that the reorganized company should issue 4 per cent. bonds to replace the present funded debt and put the road in good condition with proper equipment, and that the balance of the indebtedness should be exchanged for preferred stock. Mr. Stickney says that, to put the road in proper order, provide equipment and sufficient working capital, $2,000,000 will be required. This plan, however, is only a suggestion and no formal proposition has yet been made.

In the United States Circuit Court in Chicago, Dec. 1, a bill was filed by the Central Trust Co., of New York, to foreclose the first mortgage on the Illinois Division, under which $1,517,000 bonds have been issued. The company made no opposition, and the Court appointed a receiver, pending trial of the case.

Central Massachusetts.—Work on the extension of 26 miles from the present terminus at Jefferson, Mass., to Ware is being pushed, and it is expected that the track will be completed by the close of the year. The grading was all done some years ago.

Champaign, Havana & Western.—Holders of first-mortgage preferred and common bonds are hereby notified that on Oct. 11, 1886, the said bonds were, by the trustees of the mortgage securing the same, under and in accordance with the powers of said mortgage, declared due and payable forthwith.

All holders of such bonds are further notified that Anthony J. Thomas, having purchased the railway and property covered and conveyed by said first mortgage, at foreclosure sale upon a subsequent mortgage, will pay said first-mortgage preferred and common bonds upon presentation at his office, Drexel Building, New York City.

Notice is further given that interest upon said bonds will cease on Dec. 6 next.

Chicago & Atlantic.—In Chicago, Nov. 28, the United States Express Co. filed a bill in the United States Circuit Court, asking that this company be enjoined from permitting the Erie Express to do business over its road. The complaint stated that, under its contract with the Chicago & Atlantic Co., the United States Express Co. has an exclusive right to carry express matter over the road, but that cars of the Erie Express are now being hauled from Marion to Chicago. The Court granted a temporary injunction, pending a further hearing in the case.

Cincinnati, Hamilton & Dayton.—The called special meeting was held in Cincinnati, Nov. 30, for the purpose of voting on a proposition to issue additional preferred stock and to retire bonds and for other purposes. For some reason, however, which was unexplained, the proposition to issue stock was not submitted, but instead a communication was presented from the board of directors, stating that the plan had been reconsidered. No further action was taken and the meeting adjourned.

Cleveland & Pittsburgh.—The difficulty between this road and its freight trainmen has been settled by a compromise, the company agreeing to raise freight conductors' pay from $2.60 to $2.90 per trip and brakemen from $1.75 to $1.90, and to pay for overtime on all trips taking over 12 hours.

Danville & New River.—This company has been organized by the election of a new board of directors, and it is understood that the new management will make arrangements at once to pay off the interest overdue, and so secure the withdrawal of the foreclosure suit which has been instituted by the bondholders.

Delaware, Lackawanna & Western.—The Buffalo *Express* says: "The Lackawanna has leased from the Lehigh Valley a plot of land on the Tifft Farm just south of the Hamburg Turnpike bridge and on the west side of canal No. 1, on which the company is having built an iron dock 315 ft. long. The property, which has a depth of 300 ft., will be used for the transfer of steel rails and other heavy freight coming overy the Lackawanna road. The contract for building the dock which also includes the grading of the land, necessitating the removal of 2,700 yards of earth, has been let to Mr. Daniel E. Bailey of this city. Messrs. Hingston & Woods have the contract for dredging the channel, which will be cut to a depth of 18 ft. The dock will be finished by the opening of navigation."

Detroit, Mackinac & Marquette.—In the proposed reorganization of this road as part of the Duluth, South Shore & Atlantic, the old land-grant bondholders receive 35 per cent. of common stock in the new company and also retain their lien upon the land. The original grant of lands from the state of Michigan amounted to 1,320,000 acres situated in the counties of Chippewa, Mackinac, Marquette and Schoolcraft. The land-grant mortgage covers these lands subject to an agreement to appropriate one half the net proceeds of 400,000 acres, which shall first be sold to secure the payment of interest on the first-mortgage bonds, and the other half of such proceeds to be used in payment of expenses in the care and sale of all the lands. There was a further reservation of 20,000 acres, the proceeds from which were to be paid to the Detroit & Marquette Construction Co. In March, 1886, the company stated there had been sold and applied for 43,028 acres, and the total receipts to Jan. 1, 1886, were $299,233, of which $264,283 was from sales of timber. Out of these receipts $93,400 was paid for interest on first-mortgage bonds. Only 25 per cent. of proceeds are applicable to payment of interest, and the residue goes to constitute a sinking fund for the purchase of the bonds.

Duluth & Iron Range.—The extension of this road from its former terminus at Two Harbors, Minn., to Duluth, was completed, so far as tracklaying is concerned, on Dec. 1, although some work still remains to be done in surfacing and ballasting. This extension required some difficult work, including a number of bridges. The distance from Duluth to Two Harbors is 29½ miles, and from Duluth to the northern terminus of the road at Tower, on Vermillion Lake is 97 miles. The company has recently begun work on an extension 1½ miles long, from the present terminus of Tower into the town of that name.

East Tennessee, Virginia & Georgia.—At a meeting of the first-preferred stockholders, held at Knoxville, Tenn., last week, authority was granted the officers to issue the $1,500,000 new 5 per cent. bonds remaining in their treasury, and to apply the proceeds to betterments.

Eastern.—The subscriptions for the new preferred stock in exchange for bonds have exceeded $4,000,000. The overplus of bonds above $10,000,000 is $3,150,000. The books of subscription have been closed.

The directors have decided, when they issue the company's preferred stock in exchange for the bonds now deposited, to put it out in this wise: For each $1,000 bond will be given seven shares of preferred stock, $71 in preferred stock scrip, $229 in bond scrip. The directors have voted not to issue additional stock, that small depositors may receive par for par, and the basis will be *pro rata*. The scrip will be ready about Dec. 8, and the directors would like to deliver the preferred stock at the same date.

Georgia Midland & Gulf.—Track on this road is now laid to Ellerslie in Harris County, Ga., 17 miles northeast from Columbus, and work is advancing steadily. A regular train will be put on between Columbus and Ellerslie, and extended as the track reaches other points.

Grand Rapids & Indiana.—The statement for October and the ten months to Oct. 31, is as follows:

	October.		Ten months.	
	1886.	1885.	1886.	1885.
Earnings	$200.740	$198.252	$1,681,707	$1,604.095
Expenses	125.893	130 522	1,094.612	1,128.221
Net earnings	$74,847	$67,730	$587.095	$475.874

For the ten months the gross earnings increased $77,612, or 4.8 per cent., and the expenses decreased $33,609, or 2.9 per cent, the result being a gain of $111,221, or 23.4 per cent. in the net earnings.

Gulf, Houston & Rio Grande.—This company has been organized to build a railroad from Houston, Tex., to Presidio del Norte, a distance of about 635 miles.

Gulf & Ship Island.—The line of this road is now completed from Middletown, Tenn., on the Memphis & Charleston road, southward to Cotton Plant, Miss., a distance of 36½ miles. This section of the road is now in full operation, running regular daily trains. The company has most of the grading finished to Pontotoc, 63 miles from Middletown and 26½ miles from Cotton Plant, and the track will be laid early in the spring. Work will be begun on the southern end of the road on Jan. 1 next, the company having leased 800 convicts from the Mississippi state penitentiary for six years, beginning at that time. The line when completed will run from Jackson, Tenn., through Mississippi, to Ship Island on the Gulf, where a depth of 30 ft. of water is found near the shore, and which is considered the best harbor in the South. The line when completed will be 800 miles in length.

Hot Springs, Bear Mountain & Crystal Springs.—This company has filed articles of incorporation to build a railroad from Hot Springs, Ark., to Crystal Springs, in Montgomery County, a distance of about 50 miles.

Illinois Central.—A circular has been issued calling a meeting of the stockholders for Jan. 18, in Chicago, to act upon the following propositions:

"1. That the capital stock of the company be increased by a new issue of 10,000 shares, from 290,000 shares, of $100 each, to 300,000 shares, thus making the whole capital stock of the company $30,000,000.

"2. The shareholders of the company registered on the transfer books at the close of business on Jan. 8, 1887, shall have the privilege of subscribing to the new stock, at the rate of 3½ per cent. upon the amount of stock then registered in their names respectfully; payment for such subscriptions to be made at the company's office in New York, on or before Jan. 29, 1887, at the price of $136 for each share of such new stock, and for fractions of shares in like proportion. Certificates for fractions of shares will be issued, which shall pass by delivery and shall be exchangeable for certificates of stock when presented at the company's office in New York, in sums of $100 or multiples thereof. No dividends will accrue upon the fractions of shares. All shares of the new issue not subscribed and paid for on Jan. 20, 1887, may be disposed of to other purchasers at not less than the price above named."

In explanation of this call the following circular is issued to stockholders under date of Nov. 18:

"The board of directors have reccomended to the stockholders of the Illinois Central Railroad Co. the increase of the capital stock, in the manner and upon the terms set forth in the enclosed notice. Among the reasons which have controlled the directors in making this recommendation are these:

"Under a contract entered into by the company many years ago, and renewed in 1881, it is under an obligation to take, upon a valuation therein provided for, certain grain warehouses, or elevators, erected on the land of the company at Chicago. Nearly $500,000 is now payable by the company under that contract.

"The refunding of maturing bonds at a much lower rate of interest than has heretofore been paid, and the acquisition of new branch lines as feeders to the main line, has already absorbed a great part, and will absorb the whole, of the money this year received from the sale of new bonds. Those branches are, in great part, without proper equipment; the money to pay for which, and which must be immediately supplied, should not be taken from the earnings of the company.

"The increasing volume of our freight and passenger business requires immediately for its efficient, economical, and safe conduct, the further laying of a second track and the enlargement of terminal facilities.

"If the advice of the directors shall be accepted by the shareowners, the company will receive 136 per cent. for the new shares, and will realize 133⅛ per cent. net, taking into account the amount of dividend which will have accrued on the new shares at the date of issue. This on the assumption that a cash dividend of 3½ per cent. will be paid on March 1, 1887.

"The directors feel confident that the shareowners will concur with them in the opinion that the present is not a suitable time for this company to issue new shares at a less price than their full market value. If you shall desire to subscribe for the proportion of the new issue to which you will be entitled, in case the recommendation of the directors shall be adopted at the proposed stockholders' meeting, you are requested to complete, sign and send to this office the enclosed application at your earliest convenience."

Illinois Midland.—Justice Harlan, of the United States Circuit Court, having considered the objection to the confirmation of the foreclosure suit presented by W. B. McKeen and others, has made an order giving the McKeen party until Nov. 30 to present to the Court a bond, that, in case a resale of the property is ordered, they will pay for it at least $962,696, the amount of the court and receiver's charges, and also providing that R. K. Dow and others, purchasers at foreclosure sale, be allowed until the same time to present an agreement stating what amounts they are willing to pay into Court to meet labor and other claims if the sale be confirmed.

Indiana & Southwestern.—This company has been organized to build a railroad from the northern line of the state of Indiana, near Sturgis, Mich., southwest to the Illinois line, near Danville, Ill., a distance of about 135 miles.

Kentucky Central.—In Louisville, Nov. 24, Judge Barr of the United States Court gave the Receiver leave to pay about $120,000 and interest on the bonded debt of the Maysville & Lexington Railroad, owned and operated by the Kentucky Central. The road was made with the promise that the Louisville & Nashville's claim of a lien of $80,000 on the rolling stock should not suffer.

Kentucky Union.—This road has been sold to F. D. Cavley, of New York, who is said to represent the Standard Oil Co. The road extends from Union Junction, on the Chesapeake & Ohio, to Clay City, Ky. The company also owns large tracts of coal and timber lands. The price paid is said to have been $500,000.

Kingwood & Tunnelton.—This road was graded about a year ago from Tunnelton, W. Va., on the Baltimore & Ohio, to Kingwood, a distance of 10½ miles. Work was then stopped. The Baltimore & Ohio Co. has now offered to advance the money necessary to complete the road, provided it is given a mortgage on the line.

Lake Erie & Western.—This company has issued a circular urging stockholders to pay up the new assessment called for, to the Central Trust Co. in New York by Dec. 4. The circular says: "The Receiver's figures show that for the nine months of his receivership ending Feb. 23, 1886, the road earned $907,709, of which 80 per cent. was spent in operating and the 20 per cent. net remaining was $32,037 less than the interest charges for the nine months. For 15 months of his receivership ending Aug. 31 last, the road earned $1,530,333, of which 74 per cent. was spent in operating, and the 26 per cent. net remaining was $49,460 in excess of interest charges for the 15 months. This shows that in the last six of the 15 months the road not only earned the surplus of interest charges mentioned, but also made up the deficiency of $32,037 in the interest charges for the first nine months of the receivership. This was due partly to the improvement of business and partly to the lessened cost of operation consequent on the improvement of the property. From the statements a statement for 17 months of the receivership has been prepared and shows that in that period the road earned $1,775,351, of which 73 per cent. only was spent in operating the road, and the 27 per cent. net remaining was $85,624 more than the amount required for the payment of interest charges for the 17 months. The net earnings have been expended by the Receiver in steel rails, equipment charges, etc. There are no receiver's certificates outstanding."

Lake Shore & Michigan Southern.—The statement to the New York Railroad Commission for the quarter ending Sept. 30 is as follows:

	1886.	1885.	Inc. or Dec	P. c.
Earnings	$4,295 391	$3,677,361	I. $618.030	16.8
Expenses	2,560,051	2,337,128	I. 222,923	9 5
Net earnings	$1,735.340	$1,340,233	I. $395.107	29 5
Interest, rentals, etc.	949,551	957,026	D. 7,475	0.8
Surplus	$785,789	$383,207	I. 402,582	105.6

The total surplus for the nine months to Sept. 30 this year, as given by these statements, has been $1,356,861, against $307,299 last year; an increase of $1,049,562, or 341.5 per cent.

Lime Rock.—This road has been completed from the town of Camden, Me., to Simonton Corner, a distance of 2¼ miles. It has been built chiefly for the purpose of carrying limestone from the quarries to the extensive lime-kilns at Camden.

Maine Central.—This company has offered to lease the Portland & Ogdensburg Railroad as soon as the reorganization of that road is completed and the receivership terminated, as noted elsewhere.

Manhattan.—This company, operating all the elevated lines in New York, makes the following statement for November:

	1886.	1885.	Increase.	P.c.
Passengers carried	13,214,573	8,955,976	4,258,597	47.4
Gross earnings	$667,482	$590,892	$76,590	12.9

This year the fare was uniformly 5 cents on all the lines and at all hours; last year it was 5 cents in the commission hours, morning and evening, and 10 cents at other times.

Memphis & Charleston.—The statement for October and the four months of the fiscal year from July 1 to Oct. 31 is as follows:

	October.		Four months.	
	1886.	1885.	1886.	1885.
Earnings	$160,008	$133.794	$446,426	$418.629
Expenses	78,810	84,088	294,626	294,159
Net earnings	$82,098	$49,706	$201,806	$124,470

For the four months the gross earnings increased $77,797, or 18.6 per cent., and the expenses $461, or 0.2 per cent., the result being a gain of $77,336, or 62.1 per cent., in the net earnings.

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of Nov. 20:

The street railroad at Nuevo Laredo, connecting the custom-house and railroad station, has been completed and cars are running.

An engineer corps is being organized at Saltillo to survey finally the line of the National road from that point to San Miguel de Allende.

The International Railroad Co. is building its line to Villa Lerdo at the rate of a kilometer a day. It will reach its objective point on the Central, next year. The coal found on

the line is of good quality and fully justifies the rapid construction now going on.

Minneapolis, Sault Ste. Marie & Atlantic.—The opening of this road to the new terminus at Rhinelander, Wis., on the Milwaukee, Lake Shore & Western road, was celebrated on Nov. 23, when the officers and directors of the company took an excursion over the line. The road is now 141 miles in length, extending from Turtle Lake, Wis., to Rhinelander. At present connection between Turtle Lake and St Paul and Minneapolis is made over the Chicago, St. Paul, Minneapolis & Omaha tracks.

The terminus of the road will remain at Rhinelander for this season. A contract has been let for the extension of the road next year to Sander's Point, on Lake Michigan, 130 miles, and the intention is to build a line through to Sault Ste. Marie, 130 miles from Sander's Point, in 1888.

Missouri Pacific.—The Sedalia, Warsaw & Southern branch of this company's line, which now extends from Sedalia, Mo., on the main line, southward to Warsaw, 42 miles, is to be changed from 3 ft. to standard gauge and extended from Warsaw southward to Springfield. Work on the extension is to be begun at once.

The tracklaying on the Council Grove, Osage City & Ottawa Branch was completed to Council Grove, Kan., Nov. 25. This line is now 70 miles long, from Ottawa to Council Grove.

On the Topeka, Salina & Western Branch the track is now laid to Ness City, Kan., 126 miles from Salina, and 196 miles from Council Grove. With the Council Grove, Osage City & Ottawa Branch, this completes a line from Ottawa west to Ness City.

Mobile & Northwestern.—A suit has been begun in the United States Circuit Court at Oxford, Miss., to foreclose the mortgage on this road. The line, which has been in operation for several years, extends from Glendale, Miss., to Clarksdale, 30 miles. The completion of the Louisville, New Orleans & Texas road has deprived the line of much of its business.

Monocacy Valley.—This road is now completed from Mechanicstown, Md., to the Catoctin Iron Works in Frederick County, a distance of 3½ miles. It has been built to connect the iron works with the Western Maryland road.

Montgomery & Florida.—Track is reported laid on this road for 30 miles from Montgomery, Ala., southward. The grading has been finished for 17 miles further, and work is in progress.

New York, Danbury & Boston.—The American Finance Co., which has undertaken the construction of this road, has let a contract to Heman Clark & Co. to build the road from Danbury, Conn., to Port Chester, N. Y., and thence to New York City. According to the original plan connection was to have been made with the Suburban Rapid Transit line north of the Harlem River. It is also stated that a syndicate has taken $1,000,000 of the bonds of the new company, with an option on the same amount. This is the line which is intended to make a connection with New York for the New York & New England road, but it does not so far appear that the New York & New England Co. has any official connection with it.

New York, Lake Erie & Western.—This company's statement for October, the first month of the fiscal year, is as follows, the figures including 68 per cent. of the gross earnings and all the working expenses of the leased New York, Pennsylvania & Ohio road:

	1886.	1885.	Increase.	P. c.
Earnings	$2,234,859	$1,980 648	$254,211	12 8
Expenses	1.457,046	1,306,238	150,808	11 5
Net earnings	$777,813	$674,410	$103,403	15.3

The statement for the Erie lines proper, excluding all earnings and expenses of the New York, Pennsylvania & Ohio is as follows:

	1886.	1885.	Increase.	P. c
Earnings	$1,851.019	$1.623,737	$227,282	14 0
Expenses	1,101,811	951,102	150,709	15.8
Net earnings	$749,208	$672 635	$76,573	11.4

A comparison of the two statements shows that the 68 per cent. of the earnings of the leased road this year amounted to $383,840, and its working expenses to $355,235, leaving a profit on the lease of $28,605 for the month, against a similar profit of $1,775 last year.

New Orleans & Gulf.—Messrs. Satterthwaite & Co. in London have issued a prospectus for a loan of $800,000 first consolidated mortgage 40-year 6 per cent. gold bonds of this company, being part of an authorized issue of $1,000,000. With respect to $360,000 of these bonds, the operation is a funded proposal made to English holders of a like amount of existing divisional 7 per cent. bonds falling due in 16 years.

This company was recently formed by the consolidation of the New Orleans & Gulf and the Mississippi, Terre aux Boeufs & Lake companies. The last named company had a line in operation from New Orleans to Shell Beach on Lake Borgne, 30 miles, which is locally known as the Shell Beach road. The consolidated company is building a branch from Poydras, on the old line, to Point-a-la-Hache, 36 miles, with a spur 2½ miles long.

New York, Philadelphia & Norfolk.—A report is current that this company, or parties connected with it, are arranging for a line from Norfolk southward to Wilmington and Charleston. Such a line will be parallel to, and would compete with the Atlantic Coast line.

Norfolk & Western.—The statement for October and for the ten months to Oct. 31 is as follows:

	October.		Ten months.	
	1886.	1885.	1886.	1885.
Freight	$273.055	$236,979	$2.135,400	$1,760,188
Passengers, etc	61,657	49,002	511.612	490,868
Total	$334,712	$285,981	$2,647,012	$2,251,056
Expenses	187,252	142.258	1.579,569	1,355.791
Net earnings	$147.460	$143,723	$1,067,443	$895,265
Per cent. of exps	56	50	60	60

For the ten months the gross earnings increased $495,956, or 18 per cent., and the expenses $323,778, or 16 per cent., leaving a gain of $172,178, or 19 per cent., in the gross earnings.

Holders of South Side first preferred 8 per cent. and second preferred 6 per cent. bonds maturing Jan. 1 next are notified that these bonds will be purchased and paid for at par at maturity on presentation of the bonds at the company's office in Philadelphia. There are $100,000 of the first preferred and $93,000 of the second preferred outstanding.

Northern Pacific.—The statement for October and the four months of the fiscal year from July 1 to Oct. 31 is as follows:

	October.		Four months.	
	1886.	1885.	1886.	1885.
Earnings	$1,443,667	$1,522,285	$5,142,723	$4,718 540
Expenses	569,006	653,671	2,305,552	2.101,715
Net earnings	$874,661	$868,614	$2,837,171	$2,616,825

During the month of October 35,091 acres of land were sold for $74,946. The deferred payments on account of land amount to $3,707,611, of which $1,199,160 is applicable to the retirement of preferred stock. The amount of preferred stock retired during the month was $24,906, and the total amount outstanding is $37,981,980. The total interest-bearing debt is $74,456,321, and the bonds purchased for sinking funds amount to $464,500.

Ohio Connecting.—This company has been organized to build a railroad from a point near Sheridan station on the Pittsburgh, Cincinnati & St. Louis road, 4 miles from Pittsburgh, across the Ohio River and thence to New Brighton, Pa., a distance of 32 miles. The road is to serve as a connecting line to transfer coke and other business from the Pittsburgh, Cincinnati & St. Louis and the Monongahela Division of the Pennsylvania Railroad to the northern lines of the Pennsylvania Co. without passing over the crowded tracks in and about Pittsburgh.

Ohio & Mississippi.—In Springfield, Ill., Dec. 1, officers of this company made a proposition to the Illinois Railroad Commission offering to make an agreement to put the Springfield Division in good order, provided the pending suit be withdrawn. The Commission declined to consider the proposition.

Pacific & Atlantic.—This company has filled articles of incorporation in California to build a railroad from San Francisco, or a point on San Francisco Bay, to Bakersfield, in Fern County, a distance of 315 miles.

Pennsylvania.—The statement of the business of all lines of the Pennsylvania Railroad Company east of Pittsburgh and Erie for October, 1886, as compared with the same month of 1885, shows an increase in gross earnings of $378,177; an increase in expenses of $454,242, and a decrease in net earnings of $76,065. The ten months of 1886, as compared with the same period of 1885, show for the same lines an increase in gross earnings of $4,006,829; an increase in expenses of $2,392,032, and an increase in net earnings of $1,674,797.

This gives the following comparative statement:

	October.		Ten months.	
	1886.	1885.	1886.	1885.
Earnings	$4,737.348	$4,359 171	$41 603,635	$37,596,806
Expenses	2,877,602	2,423,360	26,769.054	24,437,022
Net earnings	$1.859,747	$1,925,811	$14,834,581	$13,159,784
Per cent. of exps.	60.9	55.6	64.3	65.0

All lines west of Pittsburgh and Erie for the ten months of 1886 show a deficiency in meeting all liabilities of $4,941, being a decreased deficiency, as compared with the same period of 1885, of $1,111,618.

Philadelphia & Reading.—The Receivers' statements give the following figures for October and the eleven months of the fiscal year from Dec. 1 to Oct. 31, for the earnings of the railroad:

	October.		Eleven months.	
	1886.	1885.	1886.	1885.
Earnings	$3,011.482	$2,878.370	$27,525.879	$26.287.122
Expenses	1,675.642	1,460,300	16,058.707	15.370.920
Net earnings	$1,343,840	$1,418,070	$11,467,17	$10,916.202

For the eleven months this shows an increase in gross earnings of $1,238,757, or 4.7 per cent.; an increase in expenses of $687,787, or 4.5 per cent., and an increase in net earnings of $550,970, or 5.0 per cent.

The traffic reported for the railroad lines is as follows:

	October.		Eleven months.	
	1886.	1885.	1886.	1885.
Tons coal	1.368,631	1,361,648	11,794.738	11.247,213
Tons merchandise	991,827	847,109	9,754.039	7,630,998
Passengers	2,275,530	2,171,091	23.598,692	21,682 129
Tons coal on colliers	45,057	50,921	475,571	512,106

The traffic shows a considerable increase in all the items except the coal shipped on the company's own colliers.

The statement for the Philadelphia & Reading Coal & Iron Co. is as follows:

	October.		Eleven months.	
	1886.	1885.	1886.	1885.
Earnings	$1.735,217	$1,837.566	$13.958,947	$14,084,637
Expenses	1,813,755	1.901,471	15,793,677	14,428.363
Deficit	$78,538	$63,905	$1,834,730	$343,726

For the eleven months the gross earnings decreased $125,690, or 0.9 per cent., and the expenses increased $1,365,314, or 9.5 per cent., making an increase of $1,491,004, or 433.8 per cent., in the deficit.

The coal mined from the company's lands was as follows:

	October.		Eleven months.	
	1886.	1885.	1886.	1885.
By company	568,048	569,616	5,040.379	4,688,629
By tenants	59,195	89,551	549.636	719,705
Total	627,243	659,167	5 590,015	5,408.334

The decrease for the month was 31,925 tons, or 4.8 per cent.; the increase for the year was 181,681 tons, or 3.3 per cent.

The joint net earnings of the two companies were as follows:

	October.		Eleven months.	
	1886	1885.	1886.	1885.
Railr ad Co., net	$1,353,840	$1,418,070	$11,467,172	$10,916.202
Coal & I. Co., def.	78,538	63,905	1,834.730	343,726
Total net	$1,275.302	$1.354,165	$9,632,442	$10,572,476

The decrease in the total net earnings for the month was $78,863, or 5 8 per cent. for the eleven months, $940,034, or 8.9 per cent.

The expenses above do not include anything for interest or rentals, the net earnings being the sums from which those charges are to be paid.

Several meetings of the Reorganization Trustees have been held, but the long promised plan of reorganization has not yet been made public, although it is said to be now practically complete.

Pittsburgh & Western.—With permission of the Court, the Receivers have leased the Narrow-Gauge Division (extending from Callery Junction to Mt. Jewett, 138½ miles, with a branch to Clarion, 6 miles), to the Bradford, Bordell & Kinzua Co., under a temporary lease, terminable on 30 days' notice. The rental is to be 35 per cent. of the gross earnings.

Portland & Ogdensburg.—As heretofore noted, negotiations have been in progress for a lease of this road to the Maine Central Co. On Nov. 29, after a discussion of the subject by the boards, the Maine Central Co. submitted the following proposition:

"The Maine Central Railroad Co. will make a perpetual lease of the Portland & Ogdensburg Railroad, assume all liabilities and interest charges, and pay a yearly rental of 1 per cent. on its capital stock for the first three years from the execution of the lease, and 2 per cent. per annum on its capital stock forever, payable semi-annually."

The road under the reorganization will be chiefly owned by the city of Portland, which held $1,350,000 of the bonds of the road which were recently foreclosed. Under the proposed lease the city would receive on the investment about 1¾ per cent. yearly for the first three years and 3⅛ per cent. yearly thereafter. The adoption of the proposal depends on the action of the city council.

The Receiver's cash statement for the quarter ending Sept. 30 is as follows:

Cash on hand July 1	$11.676
Receipts from all sources	276.959
Total	$288,635
Disbursements, including interest	247,775
Cash, Sept. 30	$40,860

The gross earnings for July were $41,256; August, $45,128; September, $49,291; total for the quarter, $135,675. The expenses for the quarter were $80,295, leaving the net earnings $55,380. Expenses included $6,660 paid on account of new locomotives.

Port Royal & Augusta.—In the suit brought by Branch and others, stockholders, to set aside the lease of this road by the Augusta & Knoxville Co. and to compel the Central Railroad Co. of Georgia, as holder of a controlling interest, to render an accounting, a demurrer was interposed by defendant. The lower court overruled this demurrer and defendant appealed to the Georgia Supreme Court. That court has now sustained the former decision, holding that there is equity in the bill and plaintiffs are entitled to a hearing on the merits of the case. The Court also holds that the Port Royal & Augusta, the Augusta & Knoxville and the Central Railroad Co. of Georgia were properly joined as defendants in the case.

Roanoke & Tar River.—This road is projected to run from Boykins, Va., on the Seaboard & Roanoke road, southward into South Carolina. The present objective point or designated southern terminus is Lewiston, in Bertie County, N. C., where connection will be made with a narrow-gauge line, recently completed from that point to Windsor the county seat. The new line has been located and grading was begun Nov. 9 with a good force, and about 3 miles are already graded and ready for the track. The remainder of the line will be pushed to completion as fast as possible.

St. Louis, Fort Scott & Wichita.—The *Commercial and Financial Chronicle* says: "This company made default on its bonds, and the minority stockholders claim that this was quite unnecessary, and done for the purpose of defrauding them. The road has been controlled since 1882 by the Missouri Pacific or Mr. Jay Gould, and is said to be a valuable property. About $5,000,000 of the $6,614,855 capital stock is owned in the Gould interest; cities, towns and counties along the line own about $400,000; and the rest is held by parties in New York, who propose to follow the course they took with the St. Joseph & Grand Island. They have made application for the appointment of an impartial receiver, and the case soon comes up before Judge Brewer, of Topeka."

St. Louis, Jerseyville & Springfield.—This road, which extends from Bates, Ill., to Grafton, and which has been part of the Wabash System, has been bought by St. Louis parties, who will organize the St. Louis & Central Illinois Co., and operate the road independently.

St. Louis Transfer.—A St. Louis dispatch of Nov. 26 says: "The St. Louis Transfer Railway, which was the outcome of an attempted squeeze by the Missouri Pacific and the Iron Mountain railroads in switching charges two years ago, and which was expected to be a river-front highway whereon all railroads desiring entrance, exit, or passage through the city might run trains on equal fronting, has been secured by Mr. Jay Gould on a lease, guaranteeing 10 per cent. on the stock for 30 years. The terms of the lease also imply a pooling arrangement between the St. Louis Bridge and the Wiggins Ferry companies. The latter company was the projector of the Transfer Railway and had until the present always been a sturdy competitor with the Gould railways until the retirement of Captain S. C. Clubb from the management, when the Gould party within the company secured the control.

"The new deal especially affects the Chicago, Burlington & Quincy, and the Merchants' Bridge, the former having almost perfected plans to build freight depots near the wholesale portion of the city, and form connection there with the Southwestern roads other than Gould's. Mr. Gould, however, secured the friendship of Mr. John Scullin, the newly elected President of the Wiggins Ferry Co., and is complete master of the situation, controlling all the terminal facilities within the city limits."

St. Paul, Minneapolis & Manitoba.—A new branch of this company's line has been completed, running from Elk River, Minn., on the St. Cloud & Fergus Falls Division, northward to Milaca, a distance of 33 miles. Regular trains commenced to run over this branch Nov. 29. The stations on the branch with the distances from Elk River are: Zimmerman, 10.23; Princeton, 19.02; Milaca, 33.08. At its northern end this branch connects with the St. Cloud & Hinckley branch.

St. Paul, St. Croix & Lake Superior.—This company has filed articles of incorporation in Minnesota to build a railroad from St. Paul to some point on Lake Superior, probably Duluth.

Securities on the New York Stock Exchange.—The Governing Committee has placed the following securities on the lists:

Boston, Hoosac Tunnel & Western, debenture 5 per cent. bonds due in 1,913, and redeemable at the option of the company at par, $2,000,000.

Buffalo, New York & Philadelphia, bank of New York's certificates of deposit for $7,000,000 consolidated 6 per cent. bonds and for $3,200,000 general mortgage 6 per cent. bonds.

Chicago, Milwaukee & St. Paul, an additional $303,000 terminal mortgage 5 per cent. bonds, making amount now listed $4,303,000.

Delaware & Hudson Canal Co., an additional $1,000,000 capital stock, issued for the purpose of providing money to retire $1,000,000 Union Coal Co. bonds, maturing Jan. 1, 1887; total capital stock now is $24,500,000.

Denver & Rio Grande, first consolidated 4 per cent. gold bonds, due Jan. 1, 1936, $22,575,000; preferred stock, $23,650,000, and common stock, $38,000,000; these in lieu of securities of the old company.

Toledo, Ann Arbor & North Michigan, first mortgage 6 per cent. gold bonds due May 1, 1924, $2,120,000.

South Atlantic & Ohio.—A considerable section of this road is now graded and tracklaying was begun last week at Bristol, Tenn. Work is to be pushed forward to Cumberland Gap as fast as possible.

Southern Pacific Co.—As noted elsewhere, this company has bought the South Pacific Coast road, the only competing line running southward from San Francisco.

South Pacific Coast.—A San Francisco dispatch of Nov. 24 says: "The entire capital stock of the South Pacific

Coast Railroad, running from San Francisco to Santa Cruz, a distance of 80 miles, was to-day transferred to the Southern Pacific Co. and the Pacific Improvement Co. The transfer placed the two latter companies in immediate possession. The amount paid cannot be ascertained, but it is believed to be between $4,000,000 and $6,000,000. The Southern Pacific Co. purchased the property which directly appertains to the railroad and its operation. The Pacific Improvement Co. acquired collateral property, comprising the real estate owned by the South Pacific Coast Railroad along its road and its water frontage in Oakland and Alameda. It is stated that no change in the management of the South Pacific Coast Railroad will be made at present."

Summerville & St. John.—This company is building a narrow gauge line from Summerville, S. C., to the Santee River. The line is to be used chiefly for lumbering purposes.

Talladega & Coosa River.—The track on this road is now laid to Stemly, Ala., on the Coosa River, 4 miles west of the late terminus at Youngs, and 19 miles from the eastern terminus at Talladega. Work is also in progress on a branch over the Coosa River and on the grading from the river to Eden, on the Georgia Pacific road, a distance of 9 miles.

Utah Midland.—This company has been incorporated in Utah to build a railroad from Salt Lake City, eastward to the Colorado line, where it is intended to connect with the new Colorado Midland road.

Vermont Railroad Commission.—Before its adjournment last week the Vermont Legislature passed the compromise bill reported by the railroad committee, as noted last week, which provides for a commission of 3 members with advisory powers.

Washington & St. Mary.—This company, which is the successor of the old Southern Maryland, is making arrangements to push work on the completion of the road from Brandywine, Md., on the Baltimore & Potomac road, to St. Mary City, on the Potomac River, in St. Mary County. A portion of the grading was completed several years ago, and the rest of the work is very light. The company intends to establish a pleasure resort at the terminus at St. Mary, where a large tract of land has been purchased. The road has been for several years in operation from Brandywine to Mechanicsville, a distance of 20 miles, doing, however, a very small business.

West Jersey.—The statement for October and the ten months to Oct. 31 is as follows:

	October.		Ten months.	
	1886.	1885.	1886.	1885.
Earnings	$96 595	$95,704	$1,173,735	$1,113,765
Expenses	56,999	58,216	715,293	682,384
Net earnings	$39,596	$37,488	$458,442	$431,381
Interest, rentals, etc.			268,566	257 299
Surplus			$189 876	$174,082

For the ten months the gross earnings increased $59,970, or 5.4 per cent.; the expenses increased $32,909, or 4.8 per cent., and the net earnings $27,061, or 6.3 per cent. Fixed charges increased $11,267, or 4.4 per cent., leaving a gain of $15,794, or 9.1 per cent., in the surplus.

Western Maryland.—In pursuance of the arrangement, heretofore noted, with the City of Baltimore, notice is given that the first-mortgage, preferred second-mortgage and second-mortgage guaranteed bonds will be paid off at the Treasurer's office in Baltimore, Jan. 3 next, and interest on those bonds will cease from that date. The money for this payment is provided by an issue of Baltimore city bonds at a low rate of interest.

West Virginia Central & Pittsburgh.—It is said that this company's extension from Keyser to Cumberland, Md., will not stop at Cumberland, but will probably be continued from that place to Hancock, and thence parallel with the Chesapeake & Ohio Canal to Williamsport, the western terminus of the Western Maryland road. The object of this extension would be to give the company an additional outlet eastward for its coal.

White Bear Lake & Wisconsin.—This company has filed articles of incorporation to build a railroad from St. Paul, Minn., to White Bear Lake, and thence to St. Croix River, on the Wisconsin line. The capital stock is $500,000.

Zanesville, Mt. Vernon & Marion.—In Zanesville, O., Nov. 27, a contract was let to E. J. Brooks and others, of New York, to build this projected line from Zanesville, O., to Marion, 140 miles. The contractors agree to complete the road within a year, and the contract price is $25,000 per mile, in securities of the company.

ANNUAL REPORTS

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette:*

Boston & Maine.

At the close of its fiscal year, Sept. 20 last, this company owned or leased and operated the following lines:

	Miles.
Main line owned, Boston to Portland, Me	115.50
" " Eastern Railroad, leased, Boston to Portland	108.29
" " " " " Con. Jun. to Conway, N. H.	72.86
Worcester, Nashua & Rochester, leased	94.48
Branches owned	8.50
Branches leased	186.77
Total	586.40
Less Methuen Branch, leased to Manchester & Lawrence	2.75
Total mileage worked	583.65

There were in all 136.97 miles of second track and 238.52 miles of sidings. Of the total of 959.14 miles of track 572.49 miles are laid with steel rails.

The equipment includes 233 locomotives; 366 passenger, 15 parlor, 4 mail, 77 baggage and 9 express cars; 2,221 box, 1,934 flat, 557 coal, 32 oil-tanks and 60 caboose cars; 1 directors' and 1 pay car, 281 gravel, 18 tool, 8 boarding and 11 derrick cars, 1 steam-shovel, 1 pile-driver and 41 snow-plows.

The general account, condensed, is as follows:

Capital stock		$7,000,000
Funded debt		4,426,000
Sinking fund, improvement bonds		55,720
Notes payable, accrued interest, etc.		2,031.142
Profit and loss, balance		1,847.549
Total		$15,360,411
Road and equipment	$10,929,118	
Stocks, bonds and other property	1,171,226	
Improvement account	958,054	
" " Eastern R. R.	478,375	
" " other leased lines	170,263	
Trustees of sinking fund	55,720	
Accounts and balances receivable	1,382,635	
Cash	215,020	
		15,360,411

The funded debt includes $1,500,000 plain 7s, due 1893; $2,000,000 plain 7s, due 1894, and $926,000 improvement 4s.

The earnings for the year were as follows, including the Worcester, Nashua & Rochester for nine months in both years, for purposes of comparison:

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Passengers	$4,040,286	$3,690,907	I. $349,379	9.5
Freight	2,929,766	2,740,438	I. 189,328	6.9
Mails	95,449	98,141	D. 2,692	2.7
Express and extra bag.	188,381	170,519	I. 17,862	10 5
Rents, etc	289,809	286,454	I. 3.355	1.2
Total earnings	$7,543,691	$6,986,459	I. $557,232	8.0
Working expenses	4,494,162	4,244,865	I. 249,297	5.9
Taxes	250,247	222,154	I. 37.093	16.7
Charges on imp. bonds	48,384	24,092	I. 24 292	100.1
Total expenses	$4,801,793	$4,491,111	I. $310,682	6.9
Net earnings	$2,741,898	$2,495,348	I. $246,550	9.9
Gross earn. per mile	13,470	12,475	I. 995	8.0
Net " " "	4.896	4,656	I. 440	9.9
Per cent. of exps	63.7	64.3	D. 0.6	

The charges ($34,494 interest and $13,890 sinking fund,) on the improvement bonds are included in expenses because the terms of the Eastern Railroad lease require it.

The expenses last year were divided as follows:

	Amount.	P.c.
General expenses, office and property	$102,541	2.2
General expenses, transportation	363,190	4 8
Passenger transportation	557,253	7.4
Freight transportation	651,843	8.6
Motive power	1,224,514	16.3
Maintenance of cars	476,488	6.3
Maintenance of way and buildings	1,058,333	14.0
Taxes and charges on improvement bonds	307,631	4.1
Total	$4,801,793	63.7

Improvements include 13 new locomotives; 2 parlor, 4 passenger, 4 combination, 5 baggage, 78 freight and 8 gravel cars; 2 locomotives and 2 parlor cars being additions to equipment, the rest built to replace old ones broken up. The United States car coupler has been put on 1,534 freight cars.

A number of stations have been repaired and rebuilt. The East Boston shops have been moved to Charlestown and the shops there enlarged. New shops are much needed to replace all the present ones.

There were 7,689 tons of new steel rails laid and 408,398 new ties used; new sidings at various points, 12.42 miles in all, were built.

The result of the year was as follows:

Net earnings, as above		$2,741,898
Rentals of all leased lines	$1,365,118	
Interest paid	255,440	
		1,620,558
Surplus over fixed charges		$1,121,340
Eastern Railroad proportion	$421.340	
Boston & Maine dividends, 9½ per cent	665.000	
		1,086.340
Balance, surplus		$35.000
Profit and loss, balance		1,812,549
Profit and loss, balance Sept. 30, 1886		$1,847.549

One dividend of 4½ per cent. was paid May 15, and one of 5 per cent. Nov. 15, making 9½ per cent. in all. The surplus, after paying the Eastern Railroad proportion, was 10 per cent. on the stock.

The traffic for the year was as follows, the figures including the Worcester, Nashua & Rochester for nine months in both years:

	1885-86.	1884-85.	Increase.	P. c.
Pass.-train miles	3,084.970			
Freight train miles	1,507,242			
Total locomotive miles	5,597,492	5,332,014	265,478	4.9
Passengers carried	17,022.581	15,910,731	1,111.850	7.0
Pas-enger-miles	224.223,291	209.604'473	14,618,818	6 9
Tons freight carried	2,703,201	2,504,627	198,574	7.9
Ton-miles	129,125,871	127,269,048	1,856,823	1.5

The average train load last year was 72.7 passengers or 85.7 tons of freight. Local business furnished 85.1 per cent. of the passenger-miles and 57.9 per cent. of the ton-miles.

The average passenger journey was 13.17 miles; the average freight haul 47.77 miles.

The average earnings per revenue train-mile were $1.64; the expenses (including taxes) were $1.04, and the net earnings $0.60.

The average receipts per passenger-mile were: Through, 1.687; local, 2.140; season ticket, 0.731; average of all, 1.802 cents. The receipts per ton-mile were: Through, 1.562; local 2.782; average of all, 2.269 cents.

The report says: "During the last session of the Massachusetts Legislature an act was passed authorizing this company and the Eastern Railroad, or the said corporations and any other railroad corporations whose roads enter the city of Boston on the northerly side, to unite in constructing a union station, and to re-arrange their tracks in such a manner as shall avoid as far as practicable the crossings of their several roads with each other at grade. This matter of grade crossings has had the consideration of your directors for many years. At your meeting in December, 1881, the matter was brought to your attention, and you, by your votes, authorized the directors to apply to the Legislature for power to construct one or more tracks on a raised grade from Mystic River to Boston, and authorized the issuing of bonds to pay for the same. An application was made to the Legislature at the next session for authority to construct an elevated road between the limits named above, but it was opposed by the other roads on the northerly side of the city, and failed of becoming a law.

"The union of our road with the Eastern under the lease has, however, changed to some extent the condition of affairs. The entirely inadequate facilities in this city for doing our increasing passenger business make it imperative that the matter shall be no longer delayed. We would therefore ask that you authorize your directors to make such arrangements with the Eastern Railroad Co., and with such other roads which enter the city on the northerly side, as may be deemed advisable, to erect a union station, and make such changes in the crossings at Charlestown and Somerville as may be practicable, and that you authorize the issuing of improvement bonds for that purpose, and the other requirements of the lease of the Eastern Railroad.

"The stockholders will remember that at a special meeting called for that purpose, and held at Lawrence, Dec. 9, 1885, the leases to this company of the Worcester, Nashua & Rochester, and the Portland & Rochester railroads, previously agreed to by the directors, were submitted to them for approval, and were both duly approved. The lease of the Worcester, Nashua & Rochester was to take effect Jan. 1, 1886. Before possession was taken under it, suit was brought in Massachusetts nominally by a stockholder of the Boston & Maine Railroad, and in New Hampshire nominally by stockholders of the Eastern Railroad Co., to enjoin any proceedings under the lease—the claim being in both suits that the contracting corporations had no power to make the lease. It was deemed desirable to put the validity of the lease beyond all possibility of controversy in the shortest possible time. Accordingly an act of the Legislature of Massachusetts, approved March 22, 1886, was procured authorizing and confirming the lease, and immediately thereafter possession was taken under it. As respects the lease of the Portland & Rochester Railroad, the stockholders of that company have not, as yet, finally passed upon the question of approving the lease. Practically this company suffers no inconvenience, because the control of the road is already substantially in its hands through its ownership of the stock. And on several grounds, which it is unnecessary to go into in detail, it has seemed prudent to your directors to take time to consider whether there are not substantial advantages in permitting the Portland & Rochester Railroad to continue to control and operate its road as an independent organization.

"Your directors have seen no reason to change their mind with regard to the wisdom of the lease of the Worcester, Nashua & Rochester Railroad. We did not take possession of the road until April 1, for reasons named above, although the road was operated for our account from Jan. 1. The time has been too short to show what it is capable of doing, but your directors feel confident that it will prove no burden to the other parts of our system."

New York, Lake Erie & Western.

The report of the President, Mr. John King, as presented at the annual meeting on Nov. 30, gives a concise and clear statement of the operations of the road for the fiscal year ending Sept. 30 last.

The total length of road owned, leased and operated is 1,663 miles, of which 1,076 are included in the New York, Lake Erie & Western proper, and 587 in the New York, Pennsylvania & Ohio.

The capital stock issued up to the close of the year is as follows:

	Preferred.	Common.	Total.
Issued to stockholders	$8,147,400	$77,303,700	$85,451,100
Held for exchange for old stock	9.300	280,100	289,400
Held subject to sale	380,200	416,200	796,400
Total	$8,536,900	$78,000,000	$86,536,900

The only changes during the year were the issue of $1,600 preferred and $80,600 common stock in exchange for old stock.

The changes in the company's debt, bonded and floating, are described in detail below.

The comparative statement of income which follows includes 68 per cent. of the gross earnings of the New York,

Pennsylvania & Ohio, and all the working expenses of that road:

	1885-86.	1884-85.	Inc. or Dec.	P.c.
Gross earnings	$22,500,047	$18,934,573	I. $3,565,474	18.8
Expenses	16,388,638	14,347,517	I. 2,041,121	14.2
Net earnings	$6,111,409	$4,587,056	I. $1,524,353	33.2
Receipts from other sources	946,460	1,002,692	D. 56,232	5.6
Total	$7,057,869	$5,589,748	I. $1,468,121	26 2
Int., rentals, etc.	7,043,258	6,966,692	I. 76,566	1.1
Surplus	$14,611	*$1,376,944	I $1,391,555	....

* Deficit.

The earnings of the whole system, including all the earnings of the New York, Pennsylvania & Ohio, were:

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Earnings	$24,471,602	$20,555,618	I. $3,915,984	19.1
Expenses	16,388,638	14,347,517	I. 2,041,121	14.2
Net earnings	$8,082,964	$6,208,101	I. $1,874,863	30.2
Gr. earn. per mile	14,715	12,368	I. 2,347	19.0
Net " "	4,860	3,735	I. 1,125	30.0
Per cent. of exps	66.97	69.79	D. 2.82	....

The working expenses were increased by large renewals, as noted in detail below.

NEW YORK, LAKE ERIE & WESTERN PROPER.

The earnings of the New York, Lake Erie & Western lines proper, excluding those of the leased New York, Pennsylvania & Ohio, were as follows:

	1885-86.	1884-85.	Inc. or Dec.	P.c.
General freight	$8,639,216	$7,228,666	I. $1,400,550	19.3
Coal	5,168,965	4,155,960	I. 1,033,005	24.4
Passengers	3,443,771	3,106,707	I. 337,064	10.8
Other	1,958,543	989,123	I. 69,420	7.0
Total	$18,310,495	$15,490,456	I. $2,820,039	18.2
Expenses	12,279,407	10,663,579	I. 1,615,8 8	15.2
Net earnings	$6,031,088	$4,826,877	I. $1,204,211	24.9
Gross earn. per mile	17,017	14,410	I. 2,607	18.1
Net earn. per mile	5,605	4,490	I. 1,115	24.8
Per cent. of exps	67.06	68.84	D. 1.77	....

The report says: "In addition to the regular expenses of the year it has been necessary to expend large amounts for work which should have been done in previous years, but which the financial embarrassment of the Company had prevented.

"The number of cross-ties put into the track for five years past has averaged but 666,049, a number altogether inadequate for keeping the road in good order. To restore the track to a proper condition, and with a view to true economy, 1,276,786 cross-ties were laid during the year, at a cost of $708,19, as against $338,332 in 1885. When it is understood that at the rate of 2,700 ties to the mile this number would be sufficient for 473 miles of single track, or 51 miles more than the distance from Jersey City to Buffalo, the immense work undertaken and the gratifying progress made will be fully realized."

There were 10,000 tons of steel rails bought and 237 miles of track ballasted.

Special improvements included the thorough repair of the line from Corning to Rochester, which had been for years allowed to depreciate. This branch was relaid with steel, 51 miles of track ballasted and new terminal stations and grounds provided in Rochester. The stations in that city are now nearly completed; the total cost of property and buildings will be about $170,000.

A new train house 140 by 600 ft., was built in Jersey City, and preparations have been made to complete the work there by building a head-house, containing waiting rooms, offices, etc., next spring. This work will cost $120,000, of which $68,789 was spent last year.

The single track bridge over the Susquehanna River is being replaced by a double-track bridge. At other points 2,059 ft. of wooden bridges have been replaced by iron. Three new stations were erected and 28 miles of sidings built.

A new passenger locomotive, burning anthracite coal, was bought and a number of others ordered. There were 19 new passenger cars bought and put in service, and 2 built to replace old ones. The report says:

"The obligations of the company to maintain the cars included in the several car trusts have been fully met, and the car equipment, outside of the car trusts, is in excellent condition.

"Many freight cars, however, which had been destroyed, torn down or otherwise lost to the service, since the reorganization in 1878, were not replaced up to the present year, when this deficiency was supplied, in part, by the purchase of 400 new box cars and 400 new coal cars, of a capacity of 25 tons each, and at a cost of $347,810, which was charged to operating expenses. The deficiency remaining amounts to 5,614 tons in capacity, which is to be supplied by cars that are contracted for delivery during this autumn. When these are put into service the whole car equipment will be restored to its integrity."

The traffic of these lines was as follows:

	1885-86.	1884-85.	Inc. or Dec.	P.c.
Pass. carried	6,261,118	5,899,757	I. 361,361	6.1
Tons merchandise	4,798,760	4,116,247	I. 682,513	16.6
Mer. ton-miles	1,095,223,024	982,270,163	I. 112,952,861	11.5
Tons coal	8,008,158	6,137,242	I. 1,870,916	31.5
Coal ton-miles	963,170,998	705,276,525	I. 257,894,473	36.5
Average rate:				
Mer. ton-mile	0.767 ct.	0.704 ct.	I. 0.063 ct.	8.9
Coal ton-mile	0.537 "	0.589 "	D. 0.052 "	8.8

The average haul last year on merchandise was 228.2 miles; on coal, 120.3 miles.

The cost of transporting a ton one mile was reduced from 0.475 cent to 0.448 cent, being the lowest in the history of the road.

NEW YORK, PENNSYLVANIA & OHIO.

The earnings of this line for the year were as follows:

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Earnings	$6,161,107	$5,065,161	I. $1,095,946	21.6
Expenses	4,109,231	3,683,937	I. 425,294	11.5
Net earnings	$2,051,876	$1,381,224	I. $670,652	48.6
Gross earn. per m.	10,496	8,629	I. 1,867	21.6
Net " " "	3,496	2,353	I. 1,143	48.6
Per cent. of exps	66.70	72.73	D. 6.03	....

On this road 5,842 tons of steel rails and 230,202 new ties were used in renewals; 54¼ miles of track were ballasted and the property thoroughly maintained.

The 68 per cent. of the gross earnings accruing to the lessee last year amounted to $4,189,552 and the expenses to $4,109,231, leaving a profit of $80,321 for the year. The net result from the date of the lease (May 1, 1883) to Sept. 30 last has been: 1883 (5 months), profit $199,540; 1883-84, loss, $270,281; 1884-5, loss, $239,820; 1885-86, profit, $80,321; net loss, three years and five months, $230,240.

The freight traffic of this road was as follows:

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Tons merchandise	3,800,023	3,010,274	I. 789,749	26.2
Mer. ton-miles	625,107,372	548,812,682	I. 76,294,690	13.9
Tons coal	2,061,298	1,696,207	I. 365,091	21.5
Coal ton-miles	198,809,732	145,419,557	I. 53,390,175	36.7
Average rate:				
Mer. ton-mile	0.555 ct.	0.479 ct.	I. 0.076 ct.	15.9
Coal ton-mile	0.536 "	0.620 "	D. 0.084 "	13.

The cost per ton-mile, including all freights, was 0.396 cent last year, against 0.409 cent in the preceding year, a reduction of 0.013 cent, or 3.2 per cent.

The report says: "The general improvement in the iron industries of the section of the country reached by your lines cannot be better illustrated than by a reference to the receipts of ore during the year on the docks at Cleveland, th total being 593,073 tons, an increase of 283,410, or 91.5 per cent. over the previous year. This business has exceeded the facilities for handling it, both in car equipment and in docks.

"Arrangements have been made to put 400 additional coal cars upon the road to accommodate the steadily increasing traffic; 150 had been received on Sept. 30, and the remainder are to be delivered before the end of the calendar year. The earnings of this road would have been much greater but for the failure of the New York, Pennsylvania & Ohio Co. to furnish the necessary number of freight cars for the proper handling of the business. It is to be hoped that the deficiency in equipment will be supplied during the year 1887.

"There have been 25 small engines belonging to the New York, Pennsylvania & Ohio Railroad sold. Will be replaced by 15 large ones, of the Consolidation pattern. The employment of the larger engines will permit of heavier trains being hauled, and will greatly facilitate the general movement of traffic, as well as effect a reduction of expense for motive power and train service."

GENERAL REMARKS.

The company has bought the brick warehouse built by Fowler Brothers at Weehawken for $113,871.

The proposition made to holders of car trust bonds, given in last year's report, has been accepted by holders of 92 per cent. of the bonds. In addition to interest $79,910 was paid on principal of car trusts last year and charged to capital account.

A new lease of the Hawley Branch has been made at a rental of $50,000 yearly, for 25 years from Jan. 1, 1886.

The rental paid for the Montgomery & Erie road has been reduced from $22,000 yearly to $17,000 until Oct. 1, 1887, after which it will be $16,000 yearly.

The Conesus Lake road, 1.7 miles in length, connecting with the Rochester Division, was bought July 22, 1886, this company becoming the owner of the entire capital stock, 375 shares, at a cost of $7,000, which, with the amount previously advanced toward the construction of this road, makes the total investment of the company in that property $15,794.

The report says: "In January, 1882, your company leased the Middletown & Crawford Railroad for the term of 99 years, at an annual rental of $10,500 and the taxes. Contemporaneously with the lease, an agreement was entered into with the United States Express Co., whereby a purchase was made by it of a majority of the stock and bonds of the Middletown & Crawford Railroad, being $48,000 of the first-mortgage bonds and $80,000 (1,600 shares) of the capital stock, your company having the option of purchasing the securities at any time, or within five days after notice being given by the Express Co. of its desire to dispose of them.

"Notice was given by the Express Co. on June 19, 1886, that this option would expire on June 24, and inasmuch as these securities yielded 7.2 per cent. upon their cost, your company availed itself of the privilege and purchased them for $91,093.

"A large and commodious boat has been added to the fleet of the Pavonia Ferry, at a cost of $90,816, and the remaining boats of the line, six in number, have been thoroughly overhauled at an outlay of $81,135.

"On March 20, 1886, an arrangement was made with Mr. James H. Small for the operation of the Pavonia Horse Railroad on terms that give this company a direct interest in the profits. So far the business has largely increased, and a profit will probably result from the new arrangement."

EXPRESS BUSINESS.

The report gives a brief history of the negotiations with the United States Express Co. in relation to a renewal of the contract which expired Jan. 31, 1886. Arbitration was resorted to, but the United States Co. refused to accept the decision and withdrew from the Erie lines May 15, on 12 days' notice. The report continues:

"Further investigation revealed the fact, that immediately after the arbitrators' award was made, the President of the Express Co., without any notice to your company, opened negotiations with the President of the Delaware, Lackawanna & Western Railroad Co., and stated that your company had driven the United States Express from its lines, and had declared its intention of absolutely refusing to transport their business thereafter. No attempt was made upon the part of the President of the Lackawanna Co. to verify this representation, but the negotiations were entered into by him and a contract agreed upon before your officers were aware that any such step was contemplated.

"It is not the purpose of this board to comment upon the action of the presidents of the Lackawanna Co. and the United States Express Co., but it is necessary to explain the history of this transaction in order that the causes which led to the establishment of the Erie Express may be fully understood and appreciated. No choice was left. Your company was obliged either to organize and establish a new express company or give up a large, valuable and perfectly legitimate traffic belonging to its line.

"On May 15, the Erie Express Co. was organized; the equipment necessary for its operation being furnished by your company at a cost of $199,101.

"Naturally, the establishment of an express line, independent of the regular express companies, aroused the jealousies of those companies and a determined effort (in which, however, the Adams Express Co. did not join) was made to destroy, at the very outset, the business of the Erie Express. The inadequate equipment of the new company made the contest, in the beginning, quite unequal, but by careful management the Erie Express has grown in strength and in public favor, until now, after an existence of but a few months, it has a reputation for efficiency excelled by none of the older express companies.

"The business and its revenue, gross and net, are rapidly increasing, and it is certain that in a very short period the new express company will not only be self-sustaining, but a source of considerable profit.

CHICAGO & ATLANTIC RAILWAY.

"Since the last report, legal proceedings were instituted in the Circuit Courts of the United States for Indiana, Ohio and Illinois, for the foreclosure of the Chicago & Atlantic first mortgage.

"Suit was originally brought by the trustee on the request of holders of past due and unpaid coupons, to secure foreclosure for interest only. The right to do this was contested by the company and by the holders of a large majority of the first-mortgage bonds. But after full argument, the Court sustained this right to foreclose for interest.

"The mortgage, however, contained provisions that in case of default in the payment of interest, the holders of a majority of the bonds might elect to declare the principal of all the bonds due and payable. Pursuant to this provision of the mortgage, a large majority of the holders of the first-mortgage bonds have declared the principal due, and directed proceedings to be taken for the foreclosure of the mortgage for principal as well as interest; and it is understood that under this direction such proceedings have been or will be instituted. Meantime, amicable relations have been established between this company and the Chicago & Atlantic Co., which have already resulted in benefit to both companies.

FINANCIAL STATEMENTS.

"In the spring of 1884 the board of directors of your company, availing itself of that provision of the second-consolidated mortgage authorizing such action, decided to pass the payment of the interest falling due June 1 of that year upon the bonds secured by that mortgage.

"The business depression continuing, the current net earnings of the property did not enable the present board to meet such interest during the fiscal year ending Sept. 30, 1885. But the general revival having come in the fall of 1885, the board determined in the early part of the present fiscal year, to provide for the entire floating indebtedness of the company, and to accomplish that object adopted the following plan:

"Your company first redeemed at par the 8,000 shares of the capital stock of the Long Dock Co., by the payment of $800,000 to the Trustee of the collateral trust mortgage, thus relieving such stock from the pledge of that mortgage. The Long Dock Co. renewed and extended the lease of its valuable property and franchises at Jersey City to your company till 1935, for a rental of $480,000 per annum ($40,000 per month), amply sufficient to meet the interest upon the bonded indebtedness of the Dock Co.; and contemporaneously therewith, the Dock Co. placed a consolidated mortgage upon its property to secure $7,500,000 of its 50-year 6 per cent. gold bonds ($3,000,000 thereof being reserved to retire the outstanding 7 per cent. bonds for like amount due in 1893). The proceeds of the sale of the $4,500,000 bonds enabled the Dock Co. to repay your company the large indebtedness due the latter by the former. At the same time your company proposed to the holders of its second-consolidated mortgage bonds, and its second-consolidated funded coupon bonds to pay in cash the coupon maturing Dec. 1, 1885, and to fund those of June and December, 1884; June, 1885; and June, 1886, into a gold bond maturing in 1969, bearing 5 per cent. interest per annum, and secured by a deposit with the Farmers' Loan & Trust Co., of the coupons thus funded, preserving all their original lien; these bonds to be redeemed at 105, at the pleasure of the company, and upon such redemption a corresponding amount of the original coupons to be canceled. This proposal has been accepted by the holders of $32,982,500 of the outstanding $33,597,400 of the second consols, and $3,957,900 of the new funded coupon bonds of 1885, have been issued.

"The $800,000 paid for the redemption of the Long Dock stock was used by the Trustee to redeem and pay off $727,000 of the 6 per cent. collateral trust bonds, thus reducing the interest charges of your company on those bonds $43,620 per annum.

"From the foregoing statement it will be seen that the fixed charges have been increased $270,000 interest at 6 per cent. on the bonds of the Long Dock Co., and $197,895 interest on $3,957,900 of the new funded 5s, and reduced by the said sum of $43,620, leaving a net increase of $424,275.

"On Sept. 30, 1885, your company owed, for loans payable $1,819,131, and for bills payable $712,716, making a total of $2,531,847, all of which has been paid. As these loans bore interest at 6 per cent. the reduction of interest on this account is $151,911 per annum.

"During the year, in addition to that upon the property at Rochester, mortgages upon other property amounting to $116,534 were paid.

"The $239,500 of the mortgage bonds of the Tioga Railroad which were past due were extended for 30 years from Dec. 21, 1885, and the rate of interest reduced from 7 to 5 per cent.

"The interest of $920,760, the amount of mortgage on the Weehawken docks, was reduced for five years from 7 to 6 per cent. per annum.

"The amount of cash on hand Sept. 30, 1886, was $886,793, and bills receivable $149,808.

CONCLUSION.

"The expectation, expressed in the last annual report, that 'Your company could earn regularly hereafter at least its entire fixed charges and rentals of leased lines,' has been realized, so far as this year is concerned, and the physical condition of the property during that period has been very greatly improved.

"The relations between the Trunk Lines have been generally harmonious, and in marked contrast with the fierce contest of the previous year. It is true that differences have sometimes arisen, as was to have been expected in the keen competition for the business of vast regions, involving immense revenue, but these have been discussed in a conciliatory spirit, and, as a rule, fair conclusions have been reached.

"It is to be hoped that 'railroad wars,' alike hurtful to the interests of the general public and the railroads, may be avoided in the future, and all the influence your board can properly exert will be used to promote peace.

"The through business eastwardly has been done upon a basis of a maximum rate of 25 cents per hundred pounds on grain and other low class freight from Chicago to New York, and it will not be contented that a rate of one-half cent per ton per mile was too much.

"Through west-bound rates were fairly maintained.

"No attempt has been made to increase the local tariff upon your lines, although, as with most of the roads in the country, it has been impossible to furnish all the cars required for the very large amount of freight offered for transportation during the late summer and autumn.

"It is not to be expected, and certainly is not consistent with economical management, that a company should provide an immense equipment which would be idle much the greater portion of the year, but it would be very unwise to fail in furnishing an equipment sufficient to meet the regular requirements of all shippers using your lines.

"The additional plant which may be needed for this purpose will demand very small outlay as compared with the immense capital now invested in your works, and it will be the policy of your board to add such requirements as may, from time to time, appear to be necessary.

"It is also the purpose to recommence ballasting upon the opening of the next spring, and to bring the physical condition of the property to as high a standard as the finances of the company will justify; and in this connection it should be remembered that the competition of your road is, for the most part, with lines always maintained in superior condition and in the greatest efficiency.

"It is especially gratifying to be able to report that the company's supplies have been purchased at the lowest market prices, and paid for as soon as the vouchers could be passed through the several departments, that the employés have been paid with the greatest promptness and regularity, and that the credit of the company stands deservedly at the highest point, a decided improvement in comparison with the conditions governing two years ago.

"It is a source of real pleasure to acknowledge the faithful and efficient service of your officers, agents, trainmen and employés generally during the year."